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TO-DAY AND TO-MORROW*

BY

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I

A Message of Appeal and Exhortation

In many medical schools in peacetime it is customary to open the new academic year with a lecture or address of welcome and encouragement. On this occasion, at a time when we all—both young and old—stand in need of the encouragement, the duty falls to your, at present, absentee Professor of Physic.

To those of you who have just come to Cambridge, the new recruits to medicine, I extend a very warm welcome on behalf of the faculty and of those sciences into which it is your good fortune to be initiated by teachers renowned far beyond the walls of this University. Alike to you and to those whose enlistment was of earlier date and whose promotion to the clinic therefore seems a little less remote I bring a message of appeal and exhortation. Where the sick are and the injured we shall need your help. Let us hope that the bombing and the blasting and the maiming will be over before you arrive on the scene. But whether they are or not we shall still need your help, for there will be tasks of human reconstruction and repair, discoveries to make, educational reforms and reforms in our body politic, and a reorganization of medicine in the service of the State to keep your generation busy for many years to come. It is for these reasons that I want to talk to you about your present and your future. If my words help to set a course for you, to disarm despondency, and to discover in what will sometimes seem the drudgery of the syllabus the small beginnings of your own small contribution to the recivilization of mankind they will not have been wasted words.

We live in exciting and difficult days. It is a common remark (you must have heard it often) that the uncertainty is indeed such that we can only live and plan from day to day. I am an optimist, and would hold that to be altogether too narrow and too blind a philosophy. Whether as individuals or as groups it was never more necessary for us to think and plan and act efficiently, both for the moment which we call To-day and for those less calculable but none the less important moments which we designate To-morrow. Without planning, vision, determination, action, we are neither making our best contribution in the present crisis nor anticipating as we should the problems and difficulties which must confront us when it passes.

It has been all too easy for each one of us in this first year of war to be taken up with the dislocation of our own affairs. Grumbling is an epiphenomenon of wartime. I am conscious and ashamed of many spoken and unspoken grumbles and frustrations of my own. But all our incidental troubles, including the interruption to study which the *Blitzkrieg* has brought, seem petty beside the latest cruel catastrophes which it has inflicted upon others. Should we not rather, therefore, in the time-worn phrase, count such blessings as remain to us? Let us consider some of yours.

II

Privileges of the Medical Student

The medical student, notwithstanding that his life and his curriculum (especially in the case of the London teaching hospitals) have been greatly disturbed and handicapped, is a very privileged person. He is immediately privileged in his generation by being considered worthy by the Government of exemption from military service. He cannot do too much to make himself worthy of that exemption. Many of you no doubt feel your position rather acutely at times and wish that you could be serving in some capacity with the fighting Forces or some other essential national service. There is no reason to doubt that you could and would give a good account of yourselves. I have recently seen medical students play their part as naturally and effectively and with as good a humour when their hospital was bombed and patients had to be moved by difficult routes to safety as if that were the occasion for which they had been particularly trained. For the moment, however, you must accept that your first line of national service is to learn as much as you can of the sciences essential to the equipment of a good doctor. There are also second lines of service to which I shall refer later. The discipline of the laboratory and the dissecting-room must precede the discipline of the ward, just as the discipline of the parade-ground precedes that of field manœuvres or of actual battle. In your case to-day academic discipline must deputize for military discipline.

The medical student is also greatly privileged in the career which lies ahead of him because it is almost the only scientific career remaining which is not concerned in some way with the destruction of life. The whole endeavour of medicine, in war as in peace, is the protection and preservation of life and limb and the advancement of learning with these ends in view. You have another privilege, too, in the infinite variety of interests and experiences which medicine provides from the day when you dissect your first frog until that on which you bid farewell to your last patient or your last class of students. Can the lawyer or the business man ever stand tiptoe for the new discovery or look back on a day's work grateful

* An opening address to students of the Cambridge Medical Faculty, October 15, 1940.

for the new discovery's humane application? For you, too, waits the privilege of choice from many opportunities when your apprenticeship is served, for medicine comprises many professions. There is general practice, often wrongly conceived as something too humble or too exacting but, in fact, still claiming the cream of the profession. There is the life of the teacher-consultant or specialist. There are whole-time academic appointments in physiology or pathology with opportunities for teaching and research. There are the public health and municipal hospital services, the colonial medical service, and service with the armed Forces. The list could be very considerably extended.

In this place finally you have a further privilege, for the direct impacts of war have not so far proved too disturbing to your studies. None can say when your battle-hour may come; but in the meantime the atmosphere of lecture-room, laboratory, college, and playing-field retains much of its peacetime sanity, so that you can make full use of an educational programme which has few rivals and of those facilities for healthy intercourse and exercise which keep mind and body fit and alert. Individual fitness and alertness are themselves a contribution to the national cause.

III

The Student's Task

Let us turn now from the student to his task. There are two main parts or qualities in a sound medical education. These may be broadly defined as the scientific and the human or humane. Both are quite indispensable to the equipment of the doctor. They are complementary and should never be allowed to conflict with one another. Never were we more urgently or more vividly reminded than we are to-day of the need for both of these qualities. Surgeons, physicians, physiologists, and pathologists are everywhere at this moment turning their attention to problems which became familiar to us but were never fully solved in the last war, and which now confront us again in variant or intensified forms. Shock and haemorrhage and their treatment, the blast effects of bombing on lungs and brain and ear, the prevention of epidemic disease in overcrowded deep shelters, to name but a few of these problems, are claiming much time and thought as well as the immediate practical ministrations of doctor and of nurse. Without anatomy, physiology, pharmacology, pathology, and biochemistry to guide their actions and to inspire and systematize research the surgeon and physician would be very helpless people. Be avid, therefore, for all that you can reasonably be expected to digest of these essential sciences during your sojourn here.

And yet remember, too, that these same sciences would avail little unless welded and amplified by the practical or field experience of the ward and out-patient clinic; by careful training of the special senses in their powers of clinical observation; and by human sympathy subjected to the long discipline which close contact with men, women, and children of all classes, and the steadfast will to help and understand them, can alone provide. It is no bad beginning to try to understand those around you first, to be dispassionately interested in their temperaments, their virtues, and their weaknesses, and sometimes, but not too introspectively, to analyse your own.

It has always seemed to me a pity that the training in observation, whether intimately clinical or broadly human, should have to remain separated so long from the other forms of scientific discipline which the pre-clinical years of study provide. I believe we shall ultimately have to find a way of maintaining a closer touch, at all stages, between the biological sciences and those practical human conundrums for the solution of which their aid is sought. Is it right that we should be compelled only by war to invoke an intimate co-operation of science and practice for the solution of a number of problems which exist in peacetime too? Men of ability have been called from the quiet of their laboratories to help us in the war hospitals. Could not their research more often have sought and found direction towards urgent human needs before the advent of war?

And might not the pre-clinical student more often find advantage and stimulus from appropriate clinical illustration of anatomical and physiological principles and from other living reminders that his province is the whole biology of man in health and disease?

IV

Developing the Social Conscience

In the meantime, however, there are plenty of other ways, apart from application to your books and bones, in which you can be making a contribution to your own and to the world's To-day and To-morrow. Although your time in Cambridge has been shortened to two years not all of that time can or should be devoted to study and preparation for tripos or qualifying examination. It is essential that you should develop yourselves as citizens too. A doctor who is not a good citizen is not a complete doctor.

Some of you will join the Home Guard and help to make yourselves citizen-soldiers. Others perhaps will join first-aid groups. Others, again, will interest themselves in social or political organizations and, maybe, find an outlet for frustrated sympathies in collections of clothing, money, or other necessities (boys' and men's clothing is urgently needed at this moment in the poorer London boroughs), or by active relief work in vacation time.

By one means or another you must develop the social conscience, which has, in the view of many of us, been too little evident in the years preceding the war. Although there have always been noble and notable exceptions in every community it has seemed to me that medical students and doctors as a body, excusing themselves on the ground of their many preoccupations with the curriculum or the anxieties of practice, have held themselves too much aloof from the larger social problems. Social selfishness and abuse of privilege are diseases as troublesome as any of those described in the textbooks of medicine, and no one is better placed to counter them and to furnish the evidence for countering them than the medical man or woman. I do not ask you necessarily to ally yourself with any particular political creed, but I do ask you to be seriously interested in man's environment and the possibilities of its improvement.

I wish I could take every one of you for a walk through some of the poorer districts of London, not only to see the havoc that has been wrought there and the wretched conditions in which thousands of amazingly courageous and uncomplaining people of the working classes are herded together nightly in their shelters, but more particularly to see the disgraceful conditions of housing which have been allowed to persist so long in twentieth-century England. Hundreds of lids have been lifted from hundreds of squalid homes by high explosive. Here, but for the inhuman cruelty of it all, the bombs might almost be deemed to have done a useful service. Alas, that they should also have cracked or flattened many beautiful blocks of modern flats for working folk that do great credit to the London County and the borough councils and remind us that in our own lifetime progress has launched a great offensive for the next generation, for your generation, to carry through!

Here, surely, is a gap in medical education, that we teach so much about man and pay such scant attention to his surroundings. The slum is the chief breeding-ground of diphtheria, tuberculosis, rickets, anaemia—conditions of which you will shortly learn to appreciate the intimate pathology, and which we are still too content to palliate and cure, although we have long known how to eradicate them altogether. A complete review of a case of diphtheria or tuberculosis should include not merely a description or demonstration of the patient, of the Klebs-Loeffler or Koch's bacillus, and of the morbid findings from a fatal case, but also a visit to the house and the school of the victim and an inspection of the family diet sheet.

V

The Higher Aim

It is the doctors of your generation who have got to teach the people, both those who suffer and those who pay too little heed to suffering, how to build the new Jerusalem in England's green and pleasant land. To do this you cannot remain entirely non-political. To do this you must be honest, objective, courageous, and outspoken.

We all pass through a stage of thinking that our generation in its day was a little wiser than the one that followed it. In this we are doubtless very often wrong, but I believe that my generation of medical students was more alive to the uses and interests and educational value of the debating and scientific society than the generation that came between the two great wars. The criticism does not apply quite so strongly to other groups of students in this University. Make every use of your opportunities here. Learn to speak in public and test for yourselves the mental stimulus of logical dispute.

This war is but the first chapter of a revolution in which you will of necessity be among the actors. You cannot afford to school yourselves in science alone. You must know something of men and movements, too; you must qualify for citizenship as well as for your baccalaureate or doctorate in medicine. Whatever form our future State may take the doctor will always be a key-man in its organization. He must earn his freedom to think and to advise, and must seek by every means in his power to become like Grenfell of Labrador, like Balzac's "Country Doctor," like many a good physician who dies unsung after an arduous life devoted to the community, a man of ideals, a man of judgment, and a man of action.

VI

Mutual Aid in Nature

Once again, therefore, let me say to you that you are privileged people. You have a task To-day to fit yourselves for a much bigger task To-morrow. The course of an artery, the conduction of the nerve impulse, the complex structure of a protein molecule, the staining reactions of bacteria, are not aimless or trivial particles of knowledge. They are essential and vital. They train the mind, the hand, and the eye. They are also a part of the total biology of man. But it is essential, too, to know and love your fellow-men and to be as much concerned with their problems as with your own. "Where there is love of man there also is love of the Art," said Hippocrates, the first great teacher of medicine. Can any other profession boast a life's concern for two such remarkable creatures as man himself and the science of man which is of his own making? But Hippocrates did not belittle the magnitude or the difficulty of our task. How difficult it all looks now! It does not look much easier, I can assure you, to those of us who for thirty years and more have been on the road which you are now prospecting. How easy to say, "Let's muddle through To-day and not bother too much about To-morrow"! But that, I am sure you will agree, is only another way of saying, "Let's be selfish." And selfishness, let me repeat, is one of the primary evils at the back of all wars and rumours of wars and of much other preventable disease. Nevertheless, Kropotkin showed that the principle of mutual aid in Nature—how well we see it demonstrated now in the heroic and devoted work of A.R.P. and fire and demolition squads!—is more effective in the long run than all the mutual conflict and destruction. Let us see to it that we foster the principle more thoroughly and fearlessly both now and when the fighting is over and past.

VII

The Help of Books

The tempo of this great war is rising. We may have more terrible times ahead than we can yet visualize, but, as witnessing the large-scale biological phenomena of human history, they will be intensely interesting times. Some of us will not live to see your To-morrow, but, however black the horizon may become, we must hope and desire most ardently to do so. Hard work, faith in the principle of mutual aid, and good emotional control are the benefits we should most desire by the way. Some of our help will come from friendships, some from books. Of books on the borderland of our common subject let me recommend a friendly shelfful. Osler's *Aequanimitas* and *An Alabama Student* and Osler's own favourite, Sir Thomas Browne's *Religio Medici*, at once occur to me. Harvey's *Circulation of the Blood*, Michael Foster's *Lectures on the History of Physiology*, Fulton's *Selected Readings in the History of Physiology*, should implement your textbook reading. For relaxation Dr. John Brown's *Rab and his Friends* with his other essays and short stories, and Balzac's *Country Doctor*. Darwin's *Expression of the Emotions in Man and Animals*, Cannon's *Bodily Changes in Pain, Hunger, Fear, and Rage*, and Pavlov's *Conditioned Reflexes* should be read before any page of a modern textbook of psychiatry is turned. Galton's *Enquiries into Human Faculty* and Kropotkin's *Mutual Aid* should set you thinking and talking. I would like to think that some of these old friends of mine, five or six of which are published in the Everyman edition, will become your friends and help to keep your science in perspective. Misapplied science, it would seem, is trying to destroy our race and all its priceless treasures of hand and mind. It must not, and cannot, succeed. And how grand it will be to be given the chance of applying our own science and our own humanity to the salvage and the mending of old treasures and to the discovery of new ones!

VIII

An Opportunity

The Cambridge Medical School is one of the best and most famous in the world. But I do not hesitate to say that it and its curriculum could be much better. It may well fall to some of you here to make them so. To others it will fall to further the science and practice of medicine far afield, to provide the disciples of science and humanity wherever they are most needed in the world.

The Moscow correspondent of the *Daily Telegraph* reports that a severe epidemic of "black death" (presumably bubonic plague) has broken out in Japanese-occupied Manchukuo, and the Soviet has ordered the establishment of quarantine posts at frontier railway stations and in the ports of Vladivostok and Nikolayevsk, on the Amur. All persons and freights from Manchuria and Korea will be subject to inspection.

PATHOGENESIS OF NON-PULMONARY TUBERCULOSIS

BY

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Calmette (1923) has argued on experimental and pathological evidence that the tubercle bacillus enters the body and may first be held up in the lymphatic glands, and that it may pass through the lymphatic chain into the blood stream, where it causes tuberculous bacillaemia. The clinical manifestations of this process are tuberculosis of the lymphatic glands and tuberculous lesions of haematogenous origin. The haematogenous tuberculous lesions are most often found in the skeleton, genito-urinary organs, peritoneum, or lungs. Some clinical observations on these forms of tuberculosis will be submitted in this paper, and the relation between tuberculosis of the lymphatic glands and haematogenous forms of tuberculosis will be discussed. The observations are based on the examination of 593 patients suffering from non-pulmonary tuberculosis admitted consecutively to the Essex County Council Sanatorium, Black Notley, during the years 1930–7. This number does not indicate all those persons who developed non-pulmonary tuberculous lesions in the County of Essex during those years, since many children with tuberculosis of the cervical and abdominal glands were treated at other sanatoria, and only an unknown proportion of patients suffering from genito-urinary and abdominal tuberculosis were passed to sanatoria for treatment. The patients who were admitted to the Black Notley Sanatorium are enumerated in Table I

TABLE I.—*Sex–Age Incidence of Patients Admitted for Treatment of Non-pulmonary Tuberculous Lesions during 1930–7*

	Male							Female							
Age	Cervical Glands	Abdominal Glands	Tuberculous Peritonitis	Skeletal Tuberculosis	Renal Tuberculosis	Genital Tuberculosis	Total	Cervical Glands	Abdominal Glands	Tuberculous Peritonitis	Tuberculous Salpingitis	Tuberculous Caecum	Skeletal Tuberculosis	Renal Tuberculosis	Total
1-10	32	9	2	67	2	0	112	24	9	3	0	0	59	1	96
11-15	12	6	1					17	3	3	0	1			
11-20				35	3	2	66						47	1	102
16-20	4	0	3					11	5	8	5	1			
21-30	3	2	1	32	8	0	46	9	3	4	4	1	38	2	61
31-40	1	1	1	14	9	3	29	3	2	3	4	2	17	5	36
41-50	0	0	0	10	4	1	15	1	0	0	0	0	9	3	13
51-60	0	0	0	9	2	0	11	2	0	0	0	0	3	1	6
Total	52	18	8	167	28	6	279	67	22	21	13	5	173	13	314

in sex and age groups. It will be seen that skeletal tuberculosis was the most common form of non-pulmonary tuberculosis occurring at all ages, that renal tuberculosis developed most often in young adult males, that tuberculous peritonitis was commoner in females than in males and was most frequent in adolescence, and that the majority of patients admitted on account of tuberculosis of the lymphatic glands were children. Patients admitted for the treatment of tuberculosis of the thoracic glands have not been included in this series.

Haematogenous Nature of Non-pulmonary Tuberculosis

The result of tuberculous bacillaemia must be the insemination in various parts of the body of foci most of which remain latent. Sometimes the haematogenous nature of a non-pulmonary tuberculous lesion may be demonstrated by its association with miliary tuberculosis of the lungs, the presence of which may be revealed by radiographic examination. The factors governing the development of a lesion are doubtful, but sites with an abundant blood supply appear to be favoured. For example, the blood-borne lesion in the child usually develops in bone near an epiphysis. Trauma appears to play a part in the production of a tuberculous lesion if it occurs in an area which is inseminated with tubercle bacilli.

If skeletal, genito-urinary, and peritoneal tuberculosis were all caused by blood-stream infection it would be expected that in many patients more than one tuberculous lesion would be present at a distance from each other or in organs not connected by their lymphatic systems. On the other hand, if tuberculosis of the lymphatic glands is not the result of blood-stream infection there would be no associated lesions in the majority of patients. These suppositions were confirmed by the findings in this series of patients. Table II shows the proportion of patients

TABLE II.—*Incidence of Additional Tuberculous Lesions associated with Non-pulmonary Tuberculous Lesions*

Site of Tuberculosis for which Patient was Admitted	No. of Patients	No. of Patients with One or More Additional Tuberculous Lesions
Tuberculous cervical adenitis ..	119	0
Tuberculous abdominal adenitis ..	40	0
Tuberculous peritonitis, salpingitis, or tuberculosis of caecum	47	13 (27.7%)
Genito-urinary tuberculosis ..	47	30 (64%)
Skeletal tuberculosis	340	86 (25.3%)

who had additional tuberculous lesions in other parts of the body. These associated tuberculous lesions were commonest in the skeleton, lungs, and kidneys.

Not only would lesions in more than one organ be expected as the result of haematogenous tuberculous infection but the foci of insemination in each organ would be multiple. There is abundant evidence that this is the case. At operations upon tuberculous bone it is usual to find multiple areas of tuberculous infection; and so, for example, the removal of an extra-articular focus near a joint may not prevent the development of tuberculosis in the joint (Cholmeley, 1939). Multiple calcified foci which are the result of tuberculous bacillaemia may be observed radiographically in the spleen in association with extra-pulmonary tuberculous lesions. Tuberculous lesions found in the kidney are multiple. A particular type of pulmonary tuberculosis which occurs in association with haematogenous tuberculous lesions has been described by Reisner (1934). This type consists of parenchymatous tuberculous lesions which tend to spread from apex to base in the form of miliary nodules. These nodules are comparable to the multiple haematogenous foci of infection in other parts of the body.

It is reasonable to suppose that tuberculous infection by the blood stream would be evenly distributed and therefore bilateral. This was found to be the case. The haematogenous form of pulmonary tuberculosis described by Reisner is bilateral. Twenty-two of the patients in this series who suffered from renal tuberculosis had a complete examination of both kidneys. Twenty showed evidence of bilateral infection. Similarly, tuberculous epididymitis was found to be bilateral in the majority of patients, although disease in both epididymides was not always manifest simultaneously. Tuberculous salpingitis is also found to be bilateral in the majority of patients. Nine of the 13 patients suffering from tuberculous salpingitis were known to have bilateral disease. Jameson (1935) states that 90% of patients with tuberculous salpingitis in a series investigated by him had bilateral

disease and 50% also had tuberculous infection of the uterus.

Tuberculous peritonitis may occur as a direct extension from tuberculous abdominal glands, but in my opinion it occurs more commonly as a haematogenous tuberculous infection or as an ascending peritonitis from tuberculous Fallopian tubes. When the infection is haematogenous miliary tubercle along the course of the blood vessels may be seen at operation. Tuberculous pleurisy is common as an associated tuberculous lesion, and occurred in six of our patients.

Tuberculosis of the Lymphatic Glands

Patients in this series suffering from tuberculosis of the lymphatic glands may be divided into two groups: those who were admitted for the treatment of tuberculous glands, and those admitted for the treatment of tuberculous lesions elsewhere and in whom tuberculous glands were also found. In the first group 119 patients were admitted for tuberculous cervical adenitis and 40 for tuberculous abdominal glands. Symptoms and signs had attracted attention to the disease, and these patients may be regarded as individuals in the community whose glands became affected with gross tuberculous disease as the result of primary infection. On examination no associated tuberculous lesions were found (Table II). Follow-up reports were received of 81 at periods varying from a few months to seven years after discharge, and in no case had a fresh tuberculous lesion developed in another part of the body. It was therefore concluded that patients *treated* for tuberculous cervical or abdominal adenitis did not develop tuberculosis elsewhere.

Glandular tuberculosis in patients of our second group was in the majority of cases diagnosed by the presence of calcifications in radiographs of the chest or abdomen. Active glandular tuberculosis was found in only a few children. None of the patients in this group showed evidence of tuberculosis of the cervical glands. The results of examination are shown in Table III. Only

TABLE III.—*Results of Examination for Evidence of Past or Present Glandular Tuberculosis in Patients Suffering from Skeletal, Peritoneal, and Genito-urinary Tuberculosis*

	Tuberculosis of Thoracic Glands	Tuberculosis of Abdominal Glands	No Evidence of Glandular Tuberculosis	Percentage Positive
Adults :				
Renal ..	9	5	26	
Peritoneal	0	0	4	
Skeletal..	1	4	57	
Total ..	10	9	87	17.9
Children :				
Renal ..	1	0	0	
Peritoneal	0	0	2	
Skeletal..	23	8	45	
Total ..	24	8	47	40.5

patients with definite calcifications or hilum gland enlargement have been included.

Table III shows that in the majority of the patients suffering from renal, peritoneal, or skeletal tuberculosis there was no gross evidence of past or present glandular tuberculosis. This, however, does not indicate that these patients did not suffer from some degree of tuberculosis of the lymphatic glands at the time of their primary infection, because in some cases the glandular tuberculosis may have subsided before the radiograph was taken or, in others, enough time may not have elapsed for calcifications in the glands to have developed. But the table tends to confirm the finding in the first group of patients, who had gross glandular tuberculosis but no haematogenous lesions; for it shows that, conversely, patients with haematogenous tuberculous lesions do not necessarily reveal evidence of previous gross glandular tuberculosis. It may be inferred, then, that gross glandular tuberculosis is not necessarily associated with severe tuberculous bacillaemia, and may, on the contrary, be a means by which severe haematogenous infection is prevented.

Discussion

It appears that the severity of haematogenous tuberculous infection is not proportional to the severity of glandular tuberculosis, and that haematogenous tuberculous lesions are not likely to appear if the glandular tuberculous lesion following primary infection is treated by constitutional measures. This suggests that under favourable conditions the lymphatic system may afford some protection against the entrance of tubercle bacilli into the blood stream. It may be supposed that not only do the cervical, thoracic, and abdominal glands present a barrier to the entrance of tubercle bacilli into the blood stream from the site of primary infection but that the regional glands exert the same function in preventing haematogenous spread from a tuberculous focus in bones or other organs. The disastrous effects of tuberculous infection in infants are well known. It appears, however, that the child is to some extent protected if the lymphoid tissue is well developed and if the child's environment and nutrition are good.

Conclusions

From an examination of these findings it may be concluded, first, that patients suffering from gross tuberculous adenitis do not under favourable conditions develop tuberculosis in other parts of the body, and, secondly, that those suffering from tuberculosis of the bones, joints, kidney, peritoneum, and genital organs do not usually show evidence of active glandular tuberculosis. It may therefore be inferred that if the degree of tuberculous infection in a series of patients were constant the intensity of tuberculous bacillaemia resulting would be in inverse proportion to the glandular reaction at the site of infection. As the lymphatic tissues are most active in childhood, an explanation is offered for the small proportion of infected children who develop haematogenous tuberculous lesions. The absence of heavy calcifications in the cervical, thoracic, or abdominal fluids and an absence of a history of glandular infection in the majority of adults suffering from haematogenous tuberculous infections suggest that patients who have had a heavy glandular infection are protected from haematogenous forms of tuberculosis in adult life.

My thanks are due to Dr. Bullough, chief tuberculosis officer to the Essex County Council, to Sir Henry Gauvain, to Dr. Burton Wood, and to the tuberculosis officers of the Essex County Council for help and advice in the investigation of the patients.

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J. Gough (*J. Path. Bact.*, 1940, **51**, 277) records the post-mortem findings in twelve Cardiff steam-coal trimmers, together with their clinical histories. All showed evidence of pneumonoconiosis and five had died of the disease. The pulmonary fibrosis was of two types, massive and nodular. The nodules differed from those of classical silicosis in being less densely fibrosed and in showing radiating rather than concentric fibrosis. Gough concludes that inhalation of Welsh steam coal dust for many years leads to serious and sometimes fatal lung fibrosis.

STAB WOUNDS OF THE CHEST

BY

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It is the universally accepted surgical teaching to explore every penetrating wound to its uttermost depths, arrest the haemorrhage, and so far as possible to remove the damaged tissue. These teachings have stood the test of experience, and one by one the various body cavities have been subjected to these procedures. Chest wounds, however, have remained in the sphere of expectant treatment. Whether this has been due to lack of experience in intrathoracic work or to the comparative freedom from the grosser surgical complications enjoyed by the average chest case I cannot say. I have felt, however, that a test should be made of a series of penetrating wounds of the chest. The opportunity for getting such a series in peacetime seldom arises, but our experience in 26 cases is here presented.

In Capetown one has remarkable opportunities for observing the effects of stab wounds, which within the last twenty years have become extremely common. The Groote Schuur Hospital serves the town and neighbouring suburbs, and about 600 stab cases are treated annually. The majority are of a trivial nature and are dealt with in the out-patient department; but in 1939, for example, on one firm alone, 160 cases were serious enough to require admission and treatment. From such a multitude of cases it is not difficult to get a number large enough to draw some broad conclusions. Accordingly, unless the condition of the patient was so bad as to render any operative intervention an entirely hopeless procedure (and it is noteworthy that as experience increases the proportion of apparently hopeless cases tends to diminish), every patient with a penetrating wound of the chest admitted under my care on Mr. W. L. Gordon's firm was subjected to an exploratory thoracotomy as an emergency measure if seen within twelve hours of the injury.

Diagnosis

As a rule the diagnosis was obvious: the presence of surgical emphysema, pneumothorax on the same side, and shifting of the apex beat were at all times considered sufficient evidence of penetration. An exploration of the wound in the casualty department, enlarging it if necessary under a local anaesthetic, often showed the site of injury. In several cases omentum or bowel projecting through the intercostal stab has indicated the presence of a thoraco-abdominal wound, and four cases of wounds of the heart and pericardium have been seen; these latter form the subject of another communication.

Other Injuries.—Associated with these chest stabs are the usual other injuries sustained in a brawl. Head and limb injuries are not uncommon. Multiple stab wounds are frequent, and as many as six stabs in the back, four on one side and two on the other, have been seen. A large number of our cases show the healed scars, surgical or otherwise, of previous fights.

Treatment

Pre-operative.—The chest wound is always covered with a biniodide compress held on with strapping in the casualty department. The patients are immediately transferred to the wards and treated for shock. A careful note is made of the apex beat and of the pulse rate, and any sudden displacement of the one or acceleration of the other calls for immediate attention. Several cases have had to be aspirated in the wards for tension pneumothorax; occasionally a blood transfusion is given pre-operatively, but this is not done as a routine. As a rule there is a rapid improvement of the general condition, and within an hour or so the patients are as fit for operation as they will ever be. They are given 1/100 grain of atropine half an hour before going to the table, and they get anti-tetanus and anti-gas serum as a routine.

Anaesthetic.—The anaesthetic of choice would undoubtedly be an intratracheal one of gas and oxygen, but as these cases usually occur at night, during the weekends, we have had to rely upon housemen whose experience in this direction is limited. Accordingly, the simplest anaesthetic is used, and one can get on very well with C.2E.3 induction, followed by ether given through an airway by a Shipway apparatus. This is simple and, in our experience, safe. Positive pressure can be obtained in a crude sort of way by increasing the oxygen flow and partially blocking the airway. It works very well, and the patient's condition seldom gives cause for anxiety. Local anaesthesia would be more often used if the patients were more co-operative and less drunk; as things are, we are seldom able to give it a trial.

In the majority of cases the patient lies on his good side with the upper arm in an arm rest. Stabs near the sternum are best treated with the patient lying on his back. Skin preparation is often done on the theatre table. The skin is cleansed with spirit soap; this is washed off with spirit, and ether is then poured over. Carbolic 1 in 20 is used for all traumatic cases, and is liberally applied.

Incision.—The edges of the original skin wound are excised and the incision is prolonged in the interspace penetrated. To facilitate matters and to speed up the procedure a very generous incision is always employed—seldom less than ten inches in length, and often longer. Should it be necessary to enlarge the incision, ribs and interspaces (the latter between two ligatures) are freely divided in the direction required. Anteriorly, the cartilages above and below are divided with a knife for stabs in this situation. The incisions have healed firmly and there have been no difficulties or complications associated with them. Where the lower six interspaces have been cut across the resultant paralysis of the upper part of the rectus abdominis has not been commented upon and has caused no symptoms.

To divide the muscles two fingers are inserted in the fascial plane superficial to the ribs, and the superficial musculature can be divided between these fingers. In this way haemorrhage is controlled and vessels may be caught before they are cut. This is a very rapid way of exposing the chest wall. The vessels are now tied off and the penetrated interspace is chosen for incision.

The intercostal neurovascular bundle is now ligated; the bundle is underpinned with two sutures of chromic catgut on a curved needle and divided between the sutures to make sure that all is secure. This procedure is performed after the rib has been resected, to prevent the waste of time that always occurs if one attempts to catch the intercostal artery lying deep in its bony groove. The freeing of the rib can be rapidly performed with a little practice, especially if it is remembered that, owing to the direction of the fibres of the external intercostal muscle, the superior border is easiest cleaned working from behind forwards and the inferior border from before backwards. An inch of rib near its angle is removed for this purpose.

In anterior incisions it is not necessary to excise a portion of rib because the interspaces are much wider and the vessels do not lie close under the rib margin. The blood supply, too, comes from the internal mammary artery, and time is wasted by tying the intercostal bundle.

Division of the costal cartilages above and below suffices for retraction.

The interspace incision is now practically bloodless. After the thorax is opened a rib-spreader is introduced. Until a Tudor Edwards double rib-spreader was obtained eighteen months ago, a de Quervain retractor was used with complete satisfaction; the double retractor gives a rather better exposure, but any powerful self-retaining instrument will do. With the chest wall open any procedure can now be undertaken. The blood in the pleura is evacuated by mopping. We have found the "sucker" to be a nuisance; if weak it does not break up the clots, and if strong the lung is constantly being sucked in. Large moist swabs are used, and only one at a time is put into the pleura.

With the blood cleaned out it is easy to see where the haemorrhage comes from, and this is now dealt with. The *lung* is grasped with lung forceps and lifted into the wound. All the surfaces of each lobe are examined, and penetrating wounds are sutured with continuous No. 0 chromic catgut on a curved intestinal needle. The pleural surfaces usually come easily into apposition; if not, one or two extra sutures bring them together. Bleeding from the lung is checked by passing the sutures deeply, but it is seldom necessary to do this. Theoretically, the less lung tissue is rendered ischaemic the better. Adhesions, owing to the frequent incidence of tubercle, have often been encountered. They are not broken down, and care is taken to avoid injuring them. They help materially in stabilizing the mediastinum.

The *diaphragm* is stitched with two layers of No. 2 chromic catgut, and if necessary the parietal wound can be extended across the upper part of the rectus abdominis, converting the thoracic into a thoraco-abdominal wound. A full exposure of the abdomen is then obtainable. Before stitching the diaphragm it is advisable to crush the phrenic nerve as it lies on the pericardium, to steady the movements and aid healing. Wounds of the *heart* are treated by suture with chromic catgut No. 1 or 2. Four cases have been encountered, of which only one falls into this series. The pericardium is left widely open, and is allowed to drain into the left or right pleura. No separate drain is used for the pericardium. No wounds of the *great vessels* have been seen. One case in which there was a wound in the pulmonary artery was, however, reported by Whitaker (1939). It was successfully stitched with three sutures of chromic catgut. Most of the intrapleural haemorrhage comes from the intercostal vessels. The artery, owing to its position in the subcostal groove, is apparently unable to retract efficiently and keeps on bleeding for a long while.

Before the chest is closed a No. 14 self-retaining catheter is put in through a separate stab wound low down in the posterior axillary line. This is stitched in place with a silkworm-gut suture, which is tied off. Another suture is now put across the stab wound and left loose, to be tied when the tube is removed.

Closure is easily effected by the insertion of three or more pericostal sutures which encircle the rib above and below. These sutures pass close to the upper border of the upper rib and to the lower part of the interspace below in order to avoid the intercostal arteries. The ribs are approximated and the pericostal sutures are tied; the superficial muscles are now closed in two layers with a running No. 2 chromic catgut suture, and the skin with interrupted silkworm-gut. It takes too long to suture the cut intercostal muscles, and the sutures tend to tear out; the wounds have done well without this procedure. The patient is returned to bed and the drainage tube is led under water. He is sat up as soon as he recovers from the anaesthetic.

After-treatment

The patient is nursed in the Fowler position and is given inhalations of CO_2 for two or three minutes every half-hour for the first twenty-four hours. In addition we have been giving full doses of sulphonamide for the first few days. Patients get 1 gramme four times a day for the first two days, 1 gramme three times a day for the next two days, and then 0.5 gramme three times a day for the last two days. We think this has had a considerable effect in reducing the incidence of infection. The thoracotomy wound as a rule heals by first intention. The drainage wound takes a little longer to heal. The tube is removed after thirty-six hours, during the first twenty-four of which about 8 to 10 oz. of blood-stained fluid is discharged; during the last twelve hours there is practically no discharge. Pain is seldom noted after the drainage tube is removed. If there is pain morphine is given freely.

Discussion

Our aim has been to get the lung re-expanded as soon as possible. Theoretically, this is desirable, because a pleural space partly filled with blood and potentially infected is an ideal situation for invading organisms. The smaller the pleural space the smaller will be the empyema should an infection occur, and the sooner will this heal. There is no worse case than the so-called "total empyema," where the lung has fallen completely away from the chest wall. It takes months to heal and there is considerable pleural scarring. Many of these cases of total empyema will require thoracoplasties for a complete closure.

It is therefore essential to find and stitch the lung wounds so that a negative pressure can be maintained in the pleura to pull the lung out. An open wound in the lung will allow air to leak into the pleura and the negative pressure is lost. In addition the leak in the lung may become valvular and a tension pneumothorax may occur. So long as the tube is *in situ* and patent everything is safe, but if the tube were to get blocked the condition of the patient would rapidly become serious. We have not seen a tension pneumothorax develop after suture in our series, but we used a wide self-retaining tube to be on the safe side. It is also essential to keep the lungs fully aerated and not to allow the bronchi to become blocked with secretion or blood. Coughing is encouraged and the CO_2 inhalations compel deep inspiration and help to loosen any plugs.

Results

In all, 17 cases were treated by the above method. Several of them are of interest. One patient, a male aged 18, showed a low-grade pyrexia for several weeks. Radiographs revealed shadows in the good lung which were interpreted as pneumonia. Finally, tuberculosis bacilli were found in the sputum; his disease had apparently become reactivated by his injury, and he was transferred to a tuberculosis sanatorium. A second case, that of a man aged 37, was treated for another firm. The tube was inadvertently left open in his dressing and not put under water. When seen forty-eight hours later it was already too late: the lung had retracted, the pleura became infected, and a total empyema which required strong suction drainage for three months resulted. In the only fatal case in the series the patient, a man aged 35, had been injured eight hours previously, and in addition to his chest wound had had his left brachial artery and median nerve completely cut across. He lay in the road for four hours and was found unconscious in a pool of blood. Two transfusions allowed him to revive to a sufficient extent to be operated upon, but in spite of another transfusion he died eighteen hours later. The post-mortem examina-

tion showed that the lung and other wounds were firmly closed, and death was attributed to "secondary shock." In another case the diaphragm, spleen, and right ventricle were injured, the lung being intact. Suture of the ventricle and of the diaphragm was done and primary union occurred.

For comparison 9 cases of penetrating wounds of the chest were treated conservatively. They were not operated upon, either because they came in after twelve hours or because they refused operation. Their average stay in hospital was 11¼ days, as against 16½ days for the operated cases, excluding two cases in which outside factors influenced their stay. The comparison is not absolutely fair because only the less serious cases are included in the second group; the serious cases are admitted sooner and do not refuse operative treatment.

Summary and Conclusions

17 consecutive cases of penetrating stab wounds of the chest were treated by operation. There was 1 death.

The average stay in hospital of 14 of these was 16½ days.

A series of 9 less serious similar stabs treated conservatively had an average of 11¼ days.

The general impression obtained is that operation is worth while. The cases are much less worrying post-operatively: aspirations and repeated pulse observations are not required. All that is necessary is for a nurse to walk down the ward and look at the bottles under the beds. The patients move about freely in their beds, and after the drainage tubes are removed they do not complain of any pain. There is much less pain than after a laparotomy, and we have not come across any of the post-operative complications that occur in the latter.

I would like to express my thanks to my chief, Mr. W. Lennox Gordon, F.R.C.S., for his courtesy in allowing me the use of his beds for treating these cases and for his kindly interest in the work.

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ATROPINE POISONING

DESCRIPTION OF AN UNUSUAL CASE

BY

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Cases of atropine poisoning either with unusual features or occurring in epidemic form were frequently reported in the literature up to 1921. Since then very few descriptions of this condition have appeared, either because it is occurring less often or because cases of unusual interest are fewer. The following case presents sufficient uncommon features to merit a brief report.

Case History

The patient, a previously healthy man aged 73, was admitted to the Central Middlesex County Hospital at 8.30 p.m. on February 4, 1940. The story was that at 11 o'clock the previous night he had reached up to a shelf for a bottle of cough mixture, and by mistake had taken down a 1-oz. bottle full of linimentum belladonnae. This he emptied of all but three drachms at a single draught. He noticed an unusual taste and a burning sensation in his mouth, and realized his mistake. He was not unduly perturbed by this and got into bed and went to sleep immediately. At 7.30 the next morning his wife was awakened by his convulsions in bed, and, becoming alarmed, she summoned a doctor, who sent the patient into hospital at once. No vomiting had occurred and no treatment had been given.

On admission, ten hours after taking the liniment, the patient was unconscious, with flushed face, stertorous breathing, and slight excoriations on the lips. His tongue and mouth were dry and leathery. The pupils were fully dilated and without reaction to light. All his limbs showed increased resistance to passive movement, and frequent convulsive movements of legs and arms occurred equally on both sides. Occasionally there was bilateral twitching of the lower face. All the tendon reflexes were brisk and equal, and an extensor plantar response was obtained on the left side. The corneal reflex was present, but the conjunctival reflex was absent. The temperature was 99.6° and the respirations 26. The cardiovascular system showed a pulse of 120, irregular, with extrasystoles. The blood pressure was 135/90. Heart sounds were poorly heard. The bladder was distended and 35 oz. of urine was subsequently withdrawn.

Morphine, 1/4 grain, was given immediately, with physostigmine, 1/50 grain. The stomach was empty, but free lavage with potassium permanganate 1 in 5,000 was carried out and half a pint of black coffee was left behind. The convulsive movements continued and the patient's condition was unchanged an hour later, except that restlessness was, if anything, increasing. Lumbar puncture was performed at 11.30 a.m. and 30 c.cm. of clear fluid withdrawn, the pressure falling from 200 mm. of water to 70. Shortly after this it was possible to rouse the patient. He was resistive and disoriented, mistaking the hospital and his nurses for his home and family. There was no direct evidence of hallucinations.

Morphine, 1/4 grain, and physostigmine, 1/50 grain, were again given at 12 noon, and the convulsive movements grew less severe. Perspiration now became profuse and he began to take fluids well. The face was still flushed, the mouth dry, the eyes sparkling, and the pupils dilated and fixed. His speech was ataxic and slurred, with, rambling incoherent phrases, and he began to show seemingly purposeful movements of his hands and arms. He tried to get out of bed, and required more attention. His pulse was stronger, and the blood pressure 150/80, but rhythm was unchanged. He could be fed with fluids without much difficulty.

At 5 p.m., six hours after admission, he was still semi-comatose, with fixed pupils, flushed face, and profuse sweating; he vomited 3 oz. of bile-stained fluid. The reflexes were brisk, the plantars flexor, the limbs less spastic, and the convulsive movements had ceased. He was restless and voluble, and seemed to be hallucinated, picking at the bedclothes. Morphine, 1/6 grain, was given. At 8 p.m. he was more rational, asking where he was: he said he was very thirsty and had burning sensations in his feet. He was sweating profusely all over, and stated that everything he looked at was blurred. He went to sleep at 11 p.m., still sweating.

Next day he was mildly excited and elated, voluble but quite rational. He was unable to give any history of the poisoning. He complained of thirst, burning of throat, unsteadiness of limbs, and headache. He still could not see distinctly. He took fluids well and had full control of his sphincters. The only abnormal physical signs were fixed dilated pupils and a persistently raised pulse rate of 120. On the third day after admission he gave a clear rational account of the accident and showed a mild euphoria, tending to laugh about the whole affair. He was quite normal the next day; his temperature and pulse had settled, but his pupils were still widely dilated and showed only the faintest reaction to light.

The patient was discharged fully recovered eleven days after admission, with pupils still larger than normal and reacting poorly to light: there were no other abnormal signs or symptoms. When seen again two months later he was in perfect health.

Discussion

Most of the reported cases of atropine poisoning in advanced age with recovery are characterized by small dosage, and illustrate the accepted teaching that susceptibility to atropine increases with age. Moorhead (1919) describes two cases of severe poisoning, one in a man aged 84 and the other in a woman aged 75, both caused

by the absorption of linimentum belladonnae through the unbroken skin after massage. Métivier (1935) also describes how a woman aged 74 developed severe symptoms of poisoning after the instillation of eye drops containing 1% atropine. She became excited, confused, and hallucinated, and the symptoms took some little time to wear off.

A fatal case is described by Taylor (1934) in which a previously healthy woman aged 66 died sixteen hours after taking only 1 drachm of linimentum belladonnae. However, in younger people recovery can occur after much larger doses. One of the largest doses is reported by Grattan (1881), who describes the case of a woman aged 43 who recovered after she had taken a wineglassful of the liniment. The dose was estimated at 18 drachms. The present case is unusual in that a man aged 73 recovered after taking 5 drachms of linimentum belladonnae (the equivalent of 1.2 grains of atropine alkaloid). The dosage was checked by his doctor and his wife: the bottle was full and unopened, there was no evidence of any having been spilt, and the patient had swallowed it at one gulp and was unable to rid himself of any of it. A further unusual feature is that ten hours elapsed before any treatment was begun. No previous record was found of a patient recovering after a large dose of atropine with such delay in treatment, and it must be rare for any patient to pay such little heed to accidental poisoning.

The treatment itself was along orthodox lines according to such authorities as Glaister (1931) and Taylor, with the addition of spinal drainage for the convulsive movements. This procedure seems not to have been previously reported in similar cases. Most benefit appeared to follow the administration of morphine in adequate dosage, although the Edinburgh committee quoted by Taylor concluded that physostigmine had in relation to atropine a wider range of antidotal action than morphine. The rational procedure seems to be a combination of the two—physostigmine as a physiological antidote and morphine as a cortical depressant. Pilocarpine, a time-honoured remedy in atropine poisoning, was not used in this case as there appears to be little evidence that it antagonizes the action of atropine on the brain (Cushny, 1924).

Further unusual features were noted in the symptomatology. Whereas the selective action of atropine on the central nervous system is well known, increased spasticity (resistance to passive movement) in the limbs with an extensor plantar response is not usually described. Presumably these signs are only indicative of the extent and severity of the poisoning. The profuse sweating is unusual, and may be taken as a good prognostic sign. It was probably greater than could be explained by the amount of physostigmine administered, and it is suggested that it represented a release phenomenon occurring as the action of the atropine wore off.

Summary

A case of accidental atropine poisoning in a man aged 73 is described and the unusual features briefly discussed.

Recovery occurred after 5 drachms of linimentum belladonnae (the equivalent of 1.2 grains of atropine alkaloid) had been taken and no treatment given until ten hours afterwards. Certain unusual symptoms are mentioned.

Treatment comprised morphine, physostigmine, and spinal drainage.

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PERFORATED PEPTIC ULCER

A REVIEW OF 175 PERSONAL CASES

BY

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"The perforation of a gastric or duodenal ulcer is one of the most serious and most overwhelming catastrophes that can befall a human being."—MOYNIHAN.

Although this well-worn subject is covered by a vast amount of literature the frequency of the condition and the vital necessity for early recognition and urgent operation justify periodical review and reconsideration. It is doubtful whether any case gives the surgeon as great a feeling of satisfaction as a perforated peptic ulcer successfully dealt with, and certainly no patient is more grateful. There still appears to be a doubt regarding the future prospects of such a case, and relatively recent statistics are conflicting. It is one of the purposes of this paper to discuss the after-histories of 89 cases in which the follow-up was successful.

The present series, consisting of 175 cases, is an entirely personal one, extending over the decade 1930–40. Of these, 7 occurred in women and 168 in male subjects.

TABLE I.—*Showing Site of Ulcer*

Duodenal ulcer	100
Gastric ulcer	71
Pyloric ring, 33; Pyloric antrum, 6; Anterior wall of body of stomach, 6; Posterior wall of body of stomach, 1; Lesser curvature, 11; Site not particularized, 14.	
Gastro-jejunal ulcer	3
Ulcer of duodenal stump (after gastrectomy some years previously)	1

In 7 cases the perforation was the second which had occurred. I carried out both operations in 2 of these.

Previous History

In reviewing this group of cases it was found that the majority had had some symptoms previous to the acute perforation. Often these symptoms consisted merely of a period of indigestion lasting for a few days or weeks, but many patients had a long-standing history. When such was the case the symptoms for the ten days or fortnight before the perforation were often said to be especially severe. A few patients stoutly adhered to the statement that there had been no previous indigestion whatsoever. In this connexion confusion has probably arisen, as many patients with perforated ulcer are, owing to pain, reluctant to speak, much less to relate details, of previous mild symptoms. For this reason most of the patients in the present series were interrogated regarding the previous history before discharge from hospital. With this precaution few were found who had not had some indigestion before the acute onset. While some cases perforated when a heavy weight was being lifted—a packing-case in one instance, thus raising a medico-legal problem—I was impressed by the fact that several perforations occurred while the patients were in bed and asleep, the severe pain awakening them.

TABLE II.—*Total Length of History*

No previous symptoms	15
History of several days	5
" " " weeks	10
" " " months	35
" " " years	53

Physical Signs and Diagnosis

The diagnosis is usually easy if it is remembered that board-like rigidity of the abdominal wall depends to a certain extent on the muscular development and usual tonus of that covering. In a female with a lax visceroptotic type of abdominal wall it is dangerous to expect to find a hard board-like rigidity, and it is valuable,

therefore, before palpating the abdomen to consider the general musculature of the patient and thereby to assess the tone of the abdominal wall in health.

Although Hamilton Bailey (1927) states that only 1 case in 10 loses liver dullness, I believe that the proportion is higher, and that it depends largely on the number of hours that have elapsed since the acute onset. When over six hours have elapsed the liver dullness is usually completely lost or is diminished ; when completely lost the sign is diagnostic.

The commonest error in diagnosis is in confusing the condition with acute appendicitis associated with generalized peritonitis. In 7 cases of acute appendicitis with generalized peritonitis I made a mid-line incision, mistaking the condition for a perforated peptic ulcer, while on 4 occasions a gridiron incision was initially made when the correct diagnosis eventually proved to be a perforated ulcer. Thus a small exploratory gridiron incision would appear to be a sound procedure in such a doubtful case. With regard to chest conditions the more frequent mistake is to delay operation in a case of perforated ulcer fearing that a diaphragmatic pleurisy is responsible for the symptoms. This is especially so in late cases of perforation, when the respiratory rate may be increased owing to the supervention of peritonitis and the board-like rigidity is no longer present.

The classical pitfall of the tabetic crisis rarely gives rise to difficulty if the condition is remembered. As Hunt and Jewesbury (1938) have pointed out, a perforated peptic ulcer occurs sometimes in patients already subject to disease of the nervous system, and I have encountered several penetrating ulcers of the lesser curvature in tabetic subjects. The important factors in the diagnosis are as follows. (1) A normal pulse must be completely disregarded in arriving at a diagnosis. Any increase of pulse rate is a prognostic sign of some gravity. (2) "Grunting" respiration, and absent or reversed abdominal breathing. (3) A small percentage of cases exhibit a rise of temperature, but only after a number of hours have elapsed and in cases of "leaking" ulcer ; usually the temperature is subnormal. (4) Marked tenderness of the recto-vesical pouch or pouch of Douglas. Widespread peritoneal involvement is also indicated by the pain experienced when the patient turns on his side for rectal examination.

Hyperaesthesia is not of frequent occurrence, although occasionally it is so pronounced that shaving of the abdominal wall must be postponed until anaesthesia has been induced.

Immediate Prognosis

As has been pointed out on numerous occasions, and more recently by Grey Turner (1938), the number of hours elapsing between the onset of the perforation and the operation is the most important single factor in assessing the immediate outlook. This point is once more emphasized by the present series. Among the 175 cases there were 28 (16%) deaths. In 19 of these the number of hours was specifically mentioned ; the delay ranged from 3 hours to 7 days, the average being 25.5 hours. If 2 very delayed cases are excluded—i.e., 5 and 7 days—the average period between the onset of the perforation and the operation in these fatal cases was 10.4 hours. The remaining 9 cases were simply described as "late."

Another important factor is the site of the ulcer, the perforated gastric ulcer being regarded as having a somewhat worse prognosis. This view should, in my opinion, be modified by grouping duodenal, pyloric, and juxtapyloric ulcers together, as the prognosis appears to be identical in these categories ; but in perforation of the stomach elsewhere there is not so good a chance of survival. Among the fatal cases were 6 ulcers of the lesser curvature of the stomach, operated on within 3, 4, 5, 10, and 24 hours of the perforation.

The third factor is one which does not seem to have had the emphasis its importance merits. While it has been generally recognized that the combination (in whatever order) of perforation and haematemesis is usually a fatal one (Gordon-Taylor), it has been overlooked that the presence of any intercurrent disease renders the prognosis infinitely worse, irrespective of the factors mentioned above. It would appear that the average individual can survive an acute perforation of a peptic ulcer operated on within reasonable time of the onset, provided he suffers from no other condition militating against his chances. In the present series, among the deaths, it was established that the following conditions had been present before operation: angina, chronic myocarditis, or auricular fibrillation, 6 cases ; chronic bronchitis, 2 ; diabetes mellitus, 3 ; chronic nephritis, 1 ; exophthalmic goitre, 1 ; syphilis, 1. Thus, in 50% of the fatal cases an intercurrent disease was present.

The most dangerous period appears to be three or four days after the operation, death being probably due to peritonitis and toxaemia. In 23 cases death occurred on an average 9.6 days after the operation, but if 3 delayed cases are excluded the average was 3.8 days. In the remaining 5 cases the duration of the period between operation and death was not clearly indicated.

Future Prognosis

It is regarding the patient's future that conflicting views are expressed (Cable, 1938 ; Scotson, 1933). The figures given in Table III strongly suggest that, provided the patient adheres to a strict dietary for six months after the operation and maintains dietetic care thereafter, his prospects are good. At the same time many symptom-free patients stated that they were taking no dietetic precautions whatsoever. The patient's occupation often gives rise to difficulties, as lorry-drivers, bus-drivers, tram-conductors, etc., have not the same dietetic facilities as individuals in other trades. In the present series 89 cases were successfully followed up. This may seem a small proportion of the whole, but is accounted for by the fact that Liverpool has a large floating population, and that in several instances the only address which the patient could give was that of a seamen's hostel. Of these 89 some were interviewed and examined, others replied to a questionary either personally or through their family doctor, and a certain number were radiographed.

TABLE III

Total number of cases followed up	89
Symptomless and carrying out their former employment	51 (57%)
Trivial or occasional mild symptoms not severe enough to cause much inconvenience or loss of work	28 (31%)
Troublesome symptoms causing definite inconvenience or loss of work	10

TABLE IV.—*Subsequent Operations (12 Cases)*

Gastrectomy (J. C. R.)	6 cases
P.G.E. (J. C. R.)	3 ,,
P.G.E. (by other surgeons)	2 ,,
No ulcer found	1 case

It is not wise to base the prognosis on the appearances of the ulcer and adjacent parts at the operation, especially in the common perforation in the vicinity of the pylorus and first part of the duodenum. Owing to the marked oedema and subserous cellulitis present in the vicinity of the ulcer little reliable information can be obtained regarding the future size of the lumen of the pylorus. In 6 cases of the present series it was noted at operation that there was a tendency to pyloric stenosis, and that subsequently a posterior gastro-enterostomy would be required. These particular cases were radiographed some months later,

and in 5 instances the barium meal revealed a normally or even rapidly emptying stomach. In all, 20 cases were radiographed at varying intervals after the operation, usually a period of six months (Table V). These were largely drawn from those individuals still complaining of pain.

TABLE V.—*Showing the Radiographic Results in 20 Cases*

Duodenal ulcer	4
Juxtapyloric ulcer	5
Lesser curvature ulcer	1
Pyloric stenosis	1
Pylorospasm	1
Distortion of duodenal cap due to adhesions	3
No ulcer	7
Rapidly emptying stomach	8
Normally emptying stomach	11

Treatment

Immediate operation is essential in every case. Possibly two justifiable reasons for slight delay are for the administration of insulin and glucose (the latter by the rectal route) in diabetes, and for the insertion of a cannula for continuous intravenous 5% glucose solution in late or feeble cases.

After a lengthy trial with various anaesthetics I came to the conclusion that open ether anaesthesia was safest in the average case, especially as the very urgency of the operation often renders it impossible to obtain a skilled anaesthetist. A combination of gas-and-oxygen and local anaesthesia is a useful alternative, while the latter alone (in the form of a rectus block) is indicated in the late case. Splanchnic block is contraindicated in view of the possibility of carrying infection from the soiled peritoneal cavity into the retroperitoneal tissues.

The operation should, in my opinion, consist of simple closure of the perforation and of removal of the fluid present in the peritoneal cavity. Drainage is necessary only in the late case. Closure of the perforation can be carried out by a double row of purse-string sutures if the site is the lesser curvature, the anterior wall of the stomach, or the pyloric antrum. When the ulcer is situated in the pyloro-duodenal region a double row of sutures is advisable; and, indeed, this method is often preferable as a routine procedure at any site. Many textbooks advise that the row of sutures be applied in a vertical direction in order to obviate narrowing of the pylorus. In my experience, however, attempts to insert sutures in a vertical line result in the catgut tearing through the oedematous friable tissue, especially when it is necessary to draw the body of the stomach upwards and towards the left to permit access to the duodenum. It was in several of these cases, sutured in a horizontal line, that pyloric narrowing was suspected at the operation but was subsequently disproved radiographically some months later. If the tissues in the vicinity of the perforation are very friable it is advisable to insert the first few sutures a short distance from the actual hole and to tie the knots of these sutures loosely. With regard to the peritoneal fluid present, although it probably remains uninfected for several hours, perhaps twelve, it is advisable, and is my custom, to remove the fluid by swabbing with abdominal packs or by suction. This is especially necessary when the fluid is turbid, glairy, or subpurulent. It is generally conceded that the amount and thickness of the fluid are factors in determining the prognosis.

With the exception of the case in which advanced pyloric stenosis is present, the performance of a gastro-enterostomy at the original operation is contraindicated for the following reasons. (1) The operation is unjustifiably lengthened by carrying out the additional procedure. (2) The ulcer which has perforated may be of the "acute" type. On two occasions I have operated on individuals suffering from repeated bouts of vomiting dating from an operation for perforation some years previously. In neither case was any trace of an ulcer or pyloric obstruction found, and following the "undoing" of the gastro-enterostomy all vomiting and other symptoms ceased. (3) Should a subsequent operation become necessary a gastro-enterostomy is rarely the wisest and most efficacious procedure. It is not proposed to enter here into the relative merits of the various "second" operations advocated, as it is hoped to deal with this difficult problem in a subsequent communication. It is sufficient to say that I prefer partial gastrectomy to any short-circuiting procedure.

Drainage by a tube inserted into the pelvis via a suprapubic stab incision is necessary when the peritoneal fluid is thick, and in late cases, perhaps when eight to twelve hours have elapsed since the acute onset.

Drainage through the main wound is unnecessary and tends to lead to an incisional hernia. For some years I have drained the right kidney pouch through a stab incision in the right flank in certain late cases, in the hope of preventing the development of a subphrenic abscess. Unfortunately this did not achieve its purpose, and subphrenic abscess appeared to develop in some of these late cases in spite of the additional drainage.

After-treatment

In desperate cases continuous 5% glucose solution by the intravenous route may be a life-saving measure, especially when the water balance is seriously disturbed, but it is not necessary in the average case. Rarely, repeated vomiting due to temporary occlusion of the pylorus by spasm or oedema must be treated by repeated or continuous aspiration of the stomach contents by means of a Ryle's tube. In the present series in only 2 cases did the vomiting persist and necessitate a gastro-enterostomy, which was successfully carried out ten days after the initial operation.

Summary

A personal series of 175 cases of acute perforated peptic ulcer is reported, the mortality being 16%.

The importance of recognizing that a subnormal temperature and a normal pulse rate must not influence the diagnosis is emphasized.

Apart from the time factor and the site of the ulcer, it is pointed out that the immediate prognosis is greatly influenced by the presence of intercurrent disease such as diabetes or myocarditis.

The present figures suggest that 57% remain symptom-free and able to continue their usual employment, provided dietetic discretion is observed. A further 31% have mild or trivial symptoms.

The operation should consist of simple closure of the perforation and removal of the peritoneal fluid, together with drainage in late cases. Objections to the routine practice of also carrying out a gastro-enterostomy are enumerated.

I am indebted to Dr. J. P. Steel, medical superintendent of Smithdown Road City Hospital, for kindly facilitating the investigation of records and following up of individual cases, and to Dr. P. H. Whitaker for the radiological examinations.

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The Academy of Sciences of the U.S.S.R. has awarded the Pavlov Prize for 1940 to Prof. Maria K. Petrova of the Pavlov Institute of Physiology and the Institute of Evolutionary Physiology and Pathology of the Higher Nervous Activity. Prof. Petrova is known for her study of experimental neuroses, their mechanism and therapy.

AMNIOPLASTIN: A WARNING

BY

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Montreal

This note is intended as a warning against the clinical use of the membrane when improperly prepared. Amnioplastin, which was described in a recent number of the *Journal*,[1] is prepared from human amniotic membrane for the purpose of preventing adhesions between dura mater and lacerated brain. In the experiments described by these authors the membrane was soaked in alcohol, followed by boiling in distilled water for twenty minutes. An alternative method was proposed which substituted dry sterilization in the autoclave for the boiling. An unsatisfactory result with membrane prepared by this alternative method must now be reported.

Ineffectiveness of Dry Sterilization

Case A (Excision of brain scar; covering with amnioplastin; formation of adhesions; recurrence of epileptiform seizures).—This was the case of a boy who had received a depressed fracture of the skull at the age of 14 when struck by a baseball. When 16 he began to have epileptic seizures, which continued until he was admitted to our clinic at the age of 18, seven months ago. Craniotomy was carried out then and a meningo-cerebral scar was removed from the right frontal region at the site of the previous injury. After careful excision the bed of removal and neighbouring brain were covered with amnioplastin and the wound closed. The immediate result was good. He was attack-free for about four months; then his attacks recurred and became frequent and severe.

Because of the unsatisfactory post-operative course he was readmitted to hospital six months after the first operation and the wound reopened. Dense adhesions were found to have formed at the site of the removal and between the adjacent brain and dura. This was objectively a much worse result than would have been expected after simple excision without the use of amnioplastin. Careful dissection was carried out and a second excision performed. This has been followed by uncomplicated recovery up to the present time. Histological examination of the excised tissue showed that the membrane had disappeared but had been replaced by dense connective tissue. The amnioplastin used for this case had been prepared by cleaning the amniotic membrane in the usual way and by sterilization in the autoclave after immersion in alcohol, but without boiling.

Preparation of Amnioplastin

Subsequent study, largely carried out by Dr. Guy Odom in this clinic, indicates that if the amniotic membrane is boiled long enough in distilled water the major portion of the fat which such membranes contain is removed. It seems likely that this accounts for the favourable results obtained by Chao, Humphreys, and Penfield in their original animal experiments. It is now evident that if the membrane is to be used in man boiling should not be omitted.

Further experiments are being carried out with Dr. Odom upon the preparation and the use of amnioplastin. They will be reported as soon as the work is completed. The urgent need of a means of prevention of adhesions in war surgery prompted the early publication of the method and now makes it necessary to issue this warning without waiting for the completion of the study.

It may be stated at this time that excellent results have been obtained in animals when the membrane is boiled or when the fatty material has been removed by adequate treatment in alcohol and ether. The membrane has been used in other human cases with apparently good results, but no other patient has been subjected to re-operation. We are not yet in a position fully to endorse its routine use in man. In the meantime we take this opportunity of advising against the use of unboiled membrane.

[1] Chao, Humphreys, and Penfield, *British Medical Journal*, 1940, **1**, 517.

Clinical Memoranda

Agranulocytosis with Angina following Sulphonamide Treatment

The following interesting case seems to merit being placed on record.

CASE REPORT

The patient, a doctor aged 62, first consulted me in October, 1939, for a severe pustular infection of both feet which had been present since March of that year. In spite of it he had continued his work at high pressure, and had even played golf, until the day he saw me. Two examinations for fungus were negative. This, with a history of psoriasis and a residual patch on the left knee, justified the diagnosis of the pustular form of that disease. He declined in-patient treatment until a superadded *B. pyocyaneus* infection rendered it imperative.

He entered a nursing home on March 12, 1940, and a week later suddenly developed pain and swelling of the dorsum of the left foot and the characteristic lines of lymphangitis, extending as high as the middle third of the leg. His temperature, previously normal, rose to 102° F. the same day, and he was ordered three 0.2-gramme tablets of a well-known sulphonamide preparation at once, to be followed by two tablets two hours later. He had therefore received 1 gramme of the drug—that is, only half the recommended dose—on the first day of the complication. On the following day the temperature declined to 98.8° F., and the whole affected area was freely discharging and had begun to desquamate. The sulphonamide was continued, as advised by the makers, in diminishing doses; altogether thirty-eight tablets (7.6 grammes) were taken during ten days. On April 7 the patient complained of a sore mouth and felt and looked extremely ill, without any skin manifestations to account for his symptoms. Several necrotic ulcers were noted on the buccal mucous membrane, on the gums, and in the neighbourhood of the lower molar teeth on both sides. The three white cell counts (see table) indicate both the nature and the cause of the complication, and fully justified the serious prognosis given by the pathologist.

	10/4/40	12/4/40	16/4/40
Red cells	5,000,000	—	—
White cells	2,500	2,300	3,000
Colour index	0.9	—	—
Haemoglobin	95%	—	—
Polymorphs	2%	1%	16%
Lymphocytes	96%	93%	80%
Basophils	0	0	2%
Eosinophils	0	0	0
Monocytes	0	4%	2%
Megaloblasts	0	2%	0

The sulphonamide was stopped the day the buccal symptoms were observed (April 7), and from then onwards the clinical improvement was rapid as regards both the drug effects and the foot condition. It was not necessary to administer pentose nucleotide, the patient making a complete haematological recovery on small doses of anahaemin and benerva.

This case illustrates once again the peculiar liability of some individuals to lose their polymorphic cells after relatively small doses of this valuable medicament, for the total amount administered was moderate compared with the 28 grammes of sulphanilamide given in six days in a case of abortus fever without ill effect (Tatlow, 1940). Such discrepancy argues a specific idiosyncrasy on the part of the

patient or an extreme toxicity of the drug or of the particular sample employed. Every patient ordered the drug should be safeguarded by repeated white cell counts *before* as well as during its administration; for that is the only reliable means of control. We should never await the onset of clinical symptoms of intolerance, for by that time it may be too late. Also, an attempt by a competent and authoritative medico-pharmacological committee to standardize the various preparations and their dosage would be welcomed by most practitioners; while there is a real need for a drastic limitation of the type of case in which the use of what is certainly a *dangerous drug* is ethically justifiable.

HENRY C. SEMON, D.M., F.R.C.P.

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Hydrosalpinx in the Abdominal Wall

The presence of bilateral hydrosalpinx in the abdominal wall must be of rare occurrence, and a recently encountered case may therefore be considered worthy of record. It adequately demonstrates the result of a technical error in surgery that is often jocularly alluded to but seldom encountered.

CASE REPORT

The patient, a woman aged 50, was referred by Dr. L. Harris, of Fulham, with a long history of lower abdominal pain and discomfort following an abdominal operation seventeen years previously. Before the operation she had been delivered of one living child, but had since remained sterile. Six months after operation she noticed the presence of a tender swelling on each side of the abdominal scar, and these had gradually enlarged and had remained tender. She had been in a state of severe discomfort ever since the operation. Recently menorrhagia had become a troublesome symptom.

Examination revealed the presence of a cystic swelling about 4 cm. in diameter in the abdominal wall to the left of the midline and a similar cystic swelling about 2 cm. in diameter on the right side. Both were slightly tender. In addition the patient had a posterior wall uterine fibroid. Uterine mobility was much restricted, and such attempts were accompanied by severe pain. At the time of the examination the nature of the previous operation was obscure, and from the clinical findings one was inclined to the view that ventrofixation had been performed. This was found to be the case, but an attempt at ventrosuspension had also been made.

A laparotomy revealed the presence of a fundal ventrofixation with the usual "stalk" formation. Both ovaries were tightly adherent to the parietal peritoneum on each side of the midline, and a knuckle of each Fallopian tube (instead of the round ligament) had been drawn through the internal abdominal ring and had been anchored to a perforation of the rectus sheath on both sides of the linea alba. The apices of each knuckle had become the site of localized hydrosalpinx, and these constituted the cystic swellings in the abdominal wall. Both round ligaments remained free and had obviously been untouched. Both tubes and ovaries were dissected free, and hysterectomy with bilateral removal of the appendages was performed because of the pressure of the fibroid. Recovery has been uneventful, and at the time of writing the patient is about to leave hospital.

COMMENTARY

This is the second time I have been called upon to deal with the results of shortening of the Fallopian tubes when the surgeon really thought he had shortened the round ligaments. A previous case came under my care some years ago, three days after the error had been perpetrated. Enough time had not elapsed for the development of hydrosalpinx in this case, but the symptoms of gangrene of the tubes were so acute as to necessitate immediate reopening of the abdomen and removal of the tubes.

It is essential in all round ligament suspension operations that the round ligaments be convincingly identified from the Fallopian tubes.

CHARLES D. READ, M.B.(N.Z.), F.R.C.S.ED., F.R.A.C.S., F.R.C.O.G.

London, W.1.

Reviews

DISEASES OF THE NERVOUS SYSTEM

Diseases of the Nervous System: Described for Practitioners and Students. By F. M. R. Walshe, O.B.E., M.D., D.Sc., F.R.C.P. (Pp. 288. 12s. 6d. net, postage 7d.) Edinburgh: E. and S. Livingstone. 1940.

This book, which is intended for students and general practitioners, fulfils its purpose admirably. Unlike many written with this object it is not a mere compilation culled from other textbooks, but presents Dr. Walshe's own experience and practice. A praiseworthy feature is the avoidance of complex and technical terms so far as this is possible. It is, in fact, written in simple direct English which the least experienced in the study of nervous disorders can have no difficulty in following: this feature should undoubtedly appeal to older practitioners who may be unfamiliar with the modern jargon which has invaded all branches of medicine.

One of the main difficulties which face the author of such a book is to decide what to include, what to omit. The policy adopted here is to deal only with those subjects which are essential to the student beginning the study of neurology and to the physician in pursuit of his professional work; it does not, and could not within its scope, pretend to be a complete treatise on nervous diseases, but only in the case of some of the rarer disorders will it fail to be a competent guide in diagnosis and treatment. Little space is allotted to ancillary methods of diagnosis; the aim is to show how this can be arrived at by clinical observation and to enable the practitioner to achieve it by means at his disposal. Unessential technicalities—as this person's sign or that nervous syndrome, which are not needed in ordinary diagnosis—are also omitted; in the author's own words, he has attempted to strip the subject of unnecessary complexities.

The first section of the volume discusses the principles of neurological diagnosis, including the factors which disturb function and influence the appearance of symptoms. The anatomical and physiological organizations of the motor, sensory, and other systems are then described simply and concisely. Only sufficient space is given to the morbid anatomy of individual affections to make the nature of these intelligible.

The greater part of the book is naturally devoted to separate diseases and clinical entities, and it is by these pages that its utility will be chiefly judged; the verdict will certainly not be unfavourable. Each disease is clearly but simply described, the most important points in their recognition are brought out, their evolution and progress are excellently sketched, and their treatment, especially that of the commoner disorders, is adequately dealt with. Special chapters are of exceptional excellence: those on cerebral vascular disorders, epilepsy, syphilis of the nervous system, and others present as good clinical pictures as can be found in much larger textbooks, and the advice given on their management and treatment on modern lines is fully adequate and practical. The final chapter on the psychoneuroses, which deals mainly with anxiety states, hysteria, and traumatic neuroses, is one of the most striking features of the book. In discussing the origin and nature of each of these conditions Dr. Walshe is not unduly influenced by any one school of thought, but presents his own views, which are essentially rational and will prove acceptable to most who bring a certain knowledge of psychology tempered with common sense to their personal experiences.

As an introduction to clinical neurology this small volume has few equals, and as a useful handbook for the practitioner it can be highly recommended.

CARE OF POLIOMYELITIS

Care of Poliomyelitis. By Jessie L. Stevenson. ($2.50 or 8s. 6d. net.) New York: The Macmillan Company. 1940.

For girls training as masseuses or orthopaedic nurses this book contains much valuable information about poliomyelitis (perhaps too much), and more particularly the nursing and treatment peculiar to the disease and its after-effects. Within its 224 pages there is, unfortunately, an over-abundance of detail; surely it should not be necessary to tell a nurse or masseuse of average intelligence that the temperature of a bath must be measured before the patient is immersed or that before massaging a limb the clothes should be removed from it. The constant repetition of detail makes the book difficult to read; to get through it at all requires a certain effort, but it is worth while for those who have the time and inclination, chiefly because the author has devoted a number of years to the study of this difficult disease. To give one example, there is a good section on the adaptations that can be made in the home, at little expense to the family, in order to increase the independence of a severely handicapped patient; and, again, instruction is given on how to get a severely paralysed patient on to his feet so that in spite of extensive paralysis he may ultimately learn how to walk for short distances. It is essentially a book of reference that ought to be found in every progressive massage department.

INJURIES OF JAWS AND FACE

Injuries of the Jaws and Face: With Special Reference to War Casualties. By W. Warwick James, O.B.E., F.R.C.S., L.D.S., and B. W. Fickling, F.R.C.S., L.D.S. (Pp. 199; 194 illustrations. 15s. net.) London: John Bale Sons and Staples, Ltd.

There is no class of injury so repulsive to the observer, so demoralizing to the patient, and so much in need of specialized surgical skill as that of combined injuries of the face and jaws. Very few surgeons, and fewer dentists, are fully competent to deal with such cases, and there are not many sources of reliable information to which reference can conveniently be made. The lessons learnt from the vast experience of the war of 1914–18 have never been sufficiently expounded or taught to the medical and dental professions, and it was therefore with some eagerness that we looked into this monograph by two dentists both of whom possess high surgical qualification. It is well known that the senior author conducted a special clinic for these injuries at the 3rd London General Hospital during that war, and the book is based upon the experience gained and the records made there. The reviewer had the privilege of seeing this clinic in action, and was much impressed with the excellent work done, the remarkable results achieved, and the very thorough follow-up system which Mr. James adopted.

With a view to assisting those who may have to set up such clinics for maxillo-facial injuries the authors begin by outlining the organization necessary to produce the best results; this section should prove useful to the administrative authorities. After a consideration of the relevant anatomy and physiology they survey the different types of injury and every phase and detail of their treatment. Special chapters are devoted to the subject of interdental wiring and the use of splints: parts of these chapters require special knowledge of dentistry for their full appreciation, and in this we see a salutary reminder that surgeon and dentist should co-operate in treating injuries of this region of the body.

One chapter deals with the technique of bone-grafting to rectify deficiencies in the mandible; in this the authors give full details of the precise method which produced excellent results in their hands. In all cases the graft was taken from the iliac crest, and gaps up to three inches were successfully bridged. The lack of discussion of other techniques in grafting is well compensated by the clear account of the method which they can personally recommend and which can be relied upon to give satisfaction. The section on the treatment of the soft tissues of the face does not give the same detail as that dealing with bony injuries, but so many books on plastic surgery of the soft parts now exist that there was perhaps not so much need for this.

In the reviewer's opinion this book should be in the hands of everyone who may have to treat injuries of the face and jaws; for the novice will be well guided, and even the expert will pick up much valuable information and advice.

The format of the volume is attractive; the paper and print are good, and the illustrations are clear and excellent.

INDUSTRIAL HYGIENE

Industrial Hygiene. By Various Authors. Edited by A. J. Lanza, M.D., and Jacob A. Goldberg, M.A., Ph.D. (Pp. 743. 42s. net.) New York, London, Toronto: Oxford University Press.

This book is the work of twenty-two American authors, who for the most part are well-recognized authorities on the subjects of which they treat. As would be expected, the quality of the articles varies greatly, and their quantity is no less variable. Some of them, such as the excellent thirteen-page article on silicosis and asbestosis by A. L. Lanza, are too short, whilst in comparison we find no less than forty-six pages devoted to nervous conditions resulting from injury. Some of the articles, such as those on tuberculosis and other pulmonary diseases, and on the heart and its disturbances, resemble ordinary textbook articles and have but little reference to industry. Of the articles which more specifically concern industry that on the care of the eyes in industry, by W. W. Weeks, is useful, and perhaps even more so is the article on physical therapy in industrial hygiene by W. Bierman. The excellent article on rehabilitation of the industrially disabled, by H. H. Kessler, is well illustrated, and includes discussions on such subjects as rehabilitation surgery, prosthesis, occupational therapy, vocational adjustment, and training. The illustrated article on occupational diseases of the skin, by L. Schwartz, furnishes detailed information about incidence, predisposing causes, actual causes, symptoms, diagnosis, treatment, prevention, and methods of investigation, but it is strange to find no reference to Prosser White's classical book on *Occupational Affections of the Skin*. The article on poisoning from lead and other heavy metals, by P. Reznikoff, includes four pages on poisoning by radium, while that on chemical hazards, including gases and fumes, by W. F. von Oettingen and R. R. Sayers, gives detailed information about the action of almost innumerable toxic bodies. The article on lighting and atmospheric control, by W. J. McConnell, gives much valuable and up-to-date information about the subjects treated, though it is inclined to be rather technical. A chapter on industrial health education and the promotion of the health and effectiveness of the worker, by C. E. Turner, is comprehensive in that it treats of subjects such as the work place, employment and placement, organization of work, supervision, dietaries, recreation, housing, and safety instruction. It is followed by a useful chapter on the nurse in industry, by Rosamond W. Goldberg, and one on problems in workmen's compensation, by J. A. Goldberg, which gives much information on medical services and benefits, and workmen's compensation laws, which will be useful to American readers.

The book gives but few references to other than American literature, and, taken as a whole, it will probably prove disappointing to most British readers. It is completed by a portentous index, eighty pages in length, which appears to have been compiled by someone who was ignorant of the subjects indexed. How else can we account for such redundancies as the single word "Acid" with twelve references, and "Blood" with thirteen references?

Notes on Books

Lord RAGLAN is well known as an unsparing critic of accepted tenets, and this characteristic is displayed in his latest anthropological study (Watts and Co., 1s. 3d.). Under the title of *Jocasta's Crime* (which was by the way an unwitting crime) he starts out to interpret the Oedipus complex and to solve the riddle of the Sphinx, which at the end he claims to have done. This, however, reminds us of Robert Browning's claim in the opening and closing lines of *Sordello,* since in neither case does the body of the work appear to satisfy it. For, truth to tell, Lord Raglan is better as a destructive than as a constructive critic. The origin of the exogamy is in our opinion a problem still unsolved. We should be sorry, however, if our failure to be convinced as to his main thesis should deter readers from enjoying the many interesting features of this little book. The author has the advantage of knowing something of primitive peoples at first hand, and therefore does not indulge in the armchair speculations as to the habits and beliefs of the noble or ignoble savage which mar some psychological studies. He is particularly interesting on the subject of myth; with Jane Harrison he believes that myth arose out of ritual, and ritual out of reliance on the power of magic. In other words, anthropomorphism is not a primitive but a later tendency. In his fascinating study of *Four Stages of Greek Religion* Gilbert Murray clearly brings out the impersonal nature of the first stage, before Olympus was tenanted by airy imaginings. It was the great merit of the Greeks that by their myths they humanized and debrutalized so many fears with their accompanying cruelties. Yet man has always been prone to torture himself and his fellows; in the primitive stage he walked in fear and trembling, hedged in between totem and taboo, ready to strike when he could not understand. But before we condemn the myths of our remote ancestors and their human sacrifices, let us reflect how in these latter days holocausts are being offered up to support the myth of the deified State.

When Dr. R. W. FAIRBROTHER'S *Textbook of Medical Bacteriology* first appeared in 1937 we commended it as a clear and orthodox presentation of its subject, in form and size well suited to the needs of medical students. It has been a pronounced success, and the third edition, in which the word "Medical" is omitted from the title, retains the chief merits of its predecessors, but might well have been more extensively revised, despite the short time which has elapsed since previous editions. Although a new paragraph has been introduced on chemotherapy in pneumonia, there is no mention of the effect of sulphonamide compounds on either anthrax or gas gangrene. This is surprising, for not only has the chemotherapy of anaerobic wound infections been much studied and debated since the war began, but the original observations on this subject, both experimental and clinical, were made no less than three years ago. The coagulase test does not receive its due as the one certain criterion of pathogenicity in staphylococci, and Erikson's work on the differentiation of human and bovine strains of *Actinomyces* is disregarded. The statement on page 190 that "the antibody molecule of rabbit serum is less than that of horse serum" takes a form which will puzzle the student, and if he is anything of a botanist he will applaud the inverted commas which enclose the strange word "hypomycete" on page 314. We venture to point out these among other minor defects in the hope that this otherwise excellent work may maintain its original high standard in the future. The publishers are William Heinemann (Medical Books), Ltd., and the price is 17s. 6d.

Preparations and Appliances

SKIN GRAFT SPREADING SHOVEL

Major MICHAEL C. OLDFIELD, R.A.M.C., F.R.C.S., writes:

After taking a razor skin graft, either of the Thiersch or the "half-thickness" type, it is useful to have a platform upon which the graft may be spread and by which the graft may be conveyed and applied to the recipient area. If the Gillies method of applying and fixing a razor graft by means of tulle gras is employed this platform is useful for flattening and applying the graft to the tulle gras.

All the grafts are cut at the first stage of the operation and are placed on the shovels. Using special long curved needles, the assistant flattens the grafts under a gentle stream of saline solution. If the graft is to be applied direct to the donor area the deep surface of the graft is placed in contact with the blade of the shovel. If the tulle gras method is used—and this is advisable in all suitable cases—the outer surface of the graft is placed downwards towards the blade

of the spreader. The graft is conveyed on the shovel to the recipient site or to the tulle gras. By means of the special curved needle the extremity of the graft nearest the toe of the shovel is drawn over the edge of the blade and held on the margin of the recipient area. The shovel is drawn gently from beneath the graft, which is in this way evenly spread. The edges of the graft remain flat and do not curl up.

The blade of this instrument is bigger than the Ballance type of lifter, so that much larger grafts can be conveyed. The handle has been specially made so that a convenient backhand grip can be taken, and its weight is such that it accurately balances that of the long blade. The flat portion of the blade is 8 in. long—No. 17 S.W.G., or 0.056 in. thick, at the handle end, tapering down to No. 28 S.W.G., or 0.0148 in., at the distal end, so that the graft will slip away from the platform smoothly. The width at the handle end is 2 in., broadening gradually to 3 in. at the distal end. The handle is 4½ in. long, with a non-slip lug at the end to facilitate a backhand grip. The handle is fixed at an angle of 45 degrees to the blade. The blade is forged from solid stainless steel, mirror-polished, and the handle is nickel silver chrome-plated.

The instrument has been made for me by Messrs. Chas. F. Thackray, Ltd., Park Street, Leeds.

SULPHANILAMIDE POWDER FOR WOUNDS

Sulphanilamide powder (Boots) is a carton preparation containing the drug in the form of a finely divided powder suitable for direct application to wounds. The use suggested is the introduction of from 5 to 15 grammes of the powder into the depths of the wound at the time of débridement. The solubility of sulphanilamide is low, and hence the solid does not produce tissue injury but dissolves slowly and exercises a prolonged bacteriostatic action. It must be remembered that the drug is absorbed when used in this manner, and hence care must be taken when combining this local treatment with oral administration of sulphonamide drugs to avoid producing a toxic blood concentration owing to the absorption by two routes. Very favourable results have been reported with the local application of sulphonamide to infected wounds.

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TREATMENT OF WAR BURNS

Under the conditions of modern warfare there is certain to be a high proportion of casualties due to burns. These casualties will affect the fighting Services and the civilian population alike, and the fluidity of the front line due to mechanization and the air arm brings new problems to our medical organization. War burns may be caused by gun-flash, bomb-flash, oil or other incendiary bombs, fires in tanks and other mechanized vehicles, by the explosion of petrol stores, or by electricity or chemicals. At sea many casualties are caused, after ships have been bombed, by the flooding of the sea by boiling or burning oil. Much has already been done to prevent burn casualties both in the Services and among the civil population, and the experience of the past few weeks has shown the splendid work and value of all the fire-fighting services. In peacetime casualties usually reach hospital within a short time of their being burnt, but under war conditions many days may often elapse before they can be brought under hospital conditions. During the evacuation from Dunkirk many men suffering from burns, wounds, and immersion reached hospital only some five days after receiving their injuries. And a similar long interval must often be expected in the case of burns occurring at sea. In war conditions burns in the Services are especially likely to involve the limbs and face, but in the case of the civil population there is less likely to be such a preponderance in these sites.

Since the present war started a few papers have been published dealing with recent experience. Murless[1] has reported a series of late cases from one of His Majesty's ships, and Cohen[2] has reviewed a series of seventy cases reaching the Emergency Medical Service hospitals during the Dunkirk evacuation. These papers, and the recent discussion on the treatment of war burns by the Sections of Surgery and of Therapeutics and Pharmacology of the Royal Society of Medicine (reported at p. 679 of this issue), have shown that the problem of treatment is by no means as simple as we had been led to suppose. When Davidson of the Henry Ford Hospital, Detroit, introduced the tannic acid treatment in 1925 it almost seemed that all our troubles were at an end. It is no criticism of the tannic acid treatment to say that until a few years before the war it had come to be regarded as a panacea in the treatment of burns. This treatment has saved thousands of lives and prevented a vast amount of suffering and deformity, but its very success led to a neglect of some of the problems of the pathological changes occurring in association with burns, and it has also engendered too great a sense of security. Recent war experience has confirmed the view of those who doubted the efficacy of tanning methods for dealing with all types of burns. The treatment of burns can be resolved into three aspects: life-saving, local treatment, and the preservation of function. Whatever form of first-aid treatment is adopted the patient must be got to hospital as quickly as possible. Once there team work is essential. The management of cases will require a knowledge of sepsis, of ill patients, of splinting, of anaesthesia, of skin grafting, and of potential deformities, and a knowledge of chest, renal, and septicaemic complications. The patients will tax nursing resources and will need to be looked after by specially trained sisters. The surgeon, the physician, the plastic surgeon, the orthopaedic surgeon, the bacteriologist, the dermatologist, the ophthalmologist, the chemotherapist, and the dietitian—all may be needed in a difficult and serious case. Some have advocated the distribution of these patients to three or four wards taking other cases and having a specially trained nursing staff. Others have advocated the segregation of cases into special hospitals with trained personnel and special equipment. The advantages of the latter would seem to be outweighed by the very real objection to the additional delay and transport in getting seriously shocked and ill patients removed to special hospitals. With the organization of "burn teams" in the existing larger hospitals it should be possible to get adequate facilities for treatment. It is certain, also, that the physician should take a considerable share in the responsibility for the treatment of the cases, especially during the stage when patients are acutely ill. But in view of the fact that many of the cases are wounded as well as being burnt, it is probably more satisfactory that the ultimate responsibility for treatment should rest in the hands of the general surgeon.

War burns bring special problems in treatment in view of the late stage at which many of the patients reach hospital—the severity of some cases and the presence of complicating wounds in others. Primary shock is not responsible for more than 2 to 3% of the deaths of those reaching hospital, but secondary shock due to the destruction of tissue proteins and loss of plasma accounts for 60% of the deaths. The use of the various tanning preparations and the administration of plasma will do much to prevent this secondary shock. Concentration of the blood is the rule in these cases, and blood transfusion is not required unless wounds have led to loss of blood. The administration of plasma will replace the protein loss and also control the oedema which occurs in so many cases. Morphine and its derivatives should be used freely for the control of pain, and shock may be further combated by hot fluid by the mouth when practicable and, failing this, by the rectum, and also by the administration of oxygen and the use of external heat. All cases should be anaesthetized before the burns are cleaned, and gas-and-oxygen or the intravenous anaesthetics such as evipan or pentothal are the most useful. Cases complicated by wounds present difficult and individual problems requiring much judgment. As yet there is no uniformity in the methods of securing tanning of the burnt areas, and tannic acid, silver tannate, and triple dye all have their advocates. These methods will usually prove adequate for the treatment of first- and second-degree burns. But when there has been a complete

[1] *British Medical Journal*, 1940, **1**, 51.
[2] Ibid., 1940, **2**, 251.

loss of skin it is probably wiser to avoid all methods of tanning. It is impossible to tan the deeper and complicated wounds thoroughly, and the tan may act as a barrier to these infected wounds and so delay healing and increase scar tissue and deformity. For these more complicated cases thermostatically controlled saline baths are probably best, with skin grafting as soon as good granulations are obtained. In this way scarring is reduced to the minimum, and to allow such wounds to heal by granulation is to invite deformity. Tanning is also best avoided on the fingers as it may occasionally interfere with the circulation by constricting the vessels, but on this point not all workers are agreed. Splinting must always be carried out with the ultimate end of restoration of function in mind, but healthy joints massaged by overlying muscles tolerate this well, whereas fingers should not be immobilized for long periods. The problem of toxaemia from burns is likely to be a more important one during war than during peace, owing to the delay in getting patients into hospital and the greater incidence of the more complicated cases. This toxaemia is mainly due to infection by streptococci. Colebrook has shown in a series of thirty-five cases that the local application of sulphanilamide powder or paste resulted in the disappearance of the streptococci within two to three days in all but two of the cases.

The treatment of wartime burns is not likely to prove as simple as it appeared at first sight, and there is still much to be learnt about the pathology of these cases, the best methods of local and general treatment, the management of the serious cases and those complicated by wounds, and the place of sulphanilamide in therapy. No one individual can possibly deal with all aspects in a really serious case, but there should be no difficulty in getting together teams of workers within the existing framework of hospital organization who will tackle the problems together and give the community the benefit of their collective experience. If this is done many valuable lives will be saved, much unnecessary suffering spared, and many deformities and disabilities avoided.

THE RESERVE CAPACITY OF THE BRAIN

It is commonly accepted that the available reserve tissue in many organs of the body is quite remarkably high—for example, the average person during the routine of ordinary life uses but a small proportion of the lung and kidney tissue which is at his disposal. But it is somewhat surprising that the same principle seems to apply to such an intricately organized mechanism as the brain, even though it is a fact well known to clinical neurologists (and often rather disconcerting to the anatomist and physiologist) that pathological lesions may cause quite extensive destruction of nervous tissue with extremely little derangement of function. Two interesting communications apposite to this problem have recently appeared. One of these, by D. O. Hebb and W. Penfield,[1] comprises a report of the functional results of bilateral removal of an extensive part of the frontal lobes of the brain. Several studies of frontal-lobe deficiencies have been made in recent years—notably by Brickner,[2] Penfield and Evans,[3] and Jefferson[4]—and the general impression left by a perusal of these works is that bilateral frontal lobectomy inevitably leads to quite definite deterioration of intellect, shown in an emotional instability which is characterized by boastfulness and self-aggrandizement, in an impairment of memory for recent events, and in a conspicuous lack of concentration with inability to undertake any sustained line of reasoning. These clinical observations, moreover, seemed to fit in very well with the results of experimental ablation of the frontal lobes in lower primates reported by Jacobsen and others, in which the outstanding features are restlessness and distractibility, and a total inability to recall recent sensory experiences in the solution of set problems. The case of Hebb and Penfield, however, suggests that such conclusions may be misleading. A man of 27 presented himself for the treatment of post-traumatic epilepsy—the result of an accident at the age of 16, when he had been struck on the forehead by an overhead carrier in a sawmill. At operation it was found that scars from the injury had formed over a large part of both frontal lobes, and the damaged tissue was removed. Careful records taken at the time of the operation, as well as subsequent radiological evidence, showed that at least a third of both frontal lobes of the brain had been destroyed and removed—or about one-seventh of the total mass of the cerebrum. Not only could no clinical or psychometric evidence of any deterioration be detected after the operation, but the improvement in the personality and intellectual capacity of the patient was quite remarkable. From being an obstinate, irresponsible, and difficult individual he became reasonable, dependable, and steady. The authors conclude, indeed, that bilateral removal of the anterior third of the frontal lobes in man does not in itself have the effect on human intelligence or personality which has been regarded as characteristic of such lesions by other authors, though they are careful to point out that only the subsequent history can determine whether the moral and intellectual functions of their own patient have been entirely unaffected by the operation.

It remains to harmonize the inferences drawn from this case with the conclusions of other neurosurgeons. Hebb and Penfield believe that the post-operative symptoms described elsewhere (following unilateral or bilateral removal of the frontal lobes) are really not deficiency symptoms at all, but are due to pathological causes of a positive nature such as the formation of extensive scar tissue or a gross disturbance of the vascular supply in the neighbourhood of the operation. If this interpretation is correct it is astonishing that so much of the cerebral cortex can be removed (and particularly all those areas of the cortex which have come to be regarded as specially distinctive of humanity) with so little to show for it. If really fundamental mental functions are subserved by the frontal poles of the brain it seems impossible to avoid the conclusion that, in their absence, the equipotentiality of the cerebral cortex is sufficiently high to allow these functions to be taken over by other cortical areas. This capacity for functional reorganization and compensation on the part of the cerebral cortex, as

[1] *Arch. Neurol. Psychiat.*, Chicago, 1940, **44**, 421.

[2] *Proc. Ass. Res. nerv. ment. Dis.*, 1934, **13**, 259.

[3] *Brain*, 1935, **58**, 115.

[4] *British Medical Journal*, 1937, **2**, 199.

M. A. Kennard[5] shows, is considerably greater in infancy than in adult life. Observations were made on young chimpanzees, baboons, and macaque monkeys from which the motor regions of the cortex had been removed. The ensuing paresis and spasticity were very much less definite than after similar operations in the mature animal. Moreover, proof was obtained that the functions usually assumed by the ablated motor areas had been taken over by the so-called sensory areas, for subsequent removal of the latter led to the appearance of motor defects which in the adult are related primarily to the motor areas alone. These experimental data are in accord with clinical experience, for the effects of cortical lesions shown in "birth palsies" are also much less pronounced than those which occur in the adult. Kennard points out that there is an anatomical basis for the transference of motor functions, because, *pace* much current teaching, the characteristic giant pyramidal cells which give rise to the fibres of the pyramidal tract are not confined to the motor cortex of the precentral convolution—they are also to be found scattered in the sensory areas of the cortex. It may be supposed that the compensatory powers of the cerebral cortex are even greater in lower mammals, in which the anatomical differentiation of the several areas of the cortex is less advanced. In this connexion it is interesting to recall a remarkable observation published last year by K. S. Lashley.[6] This experimental psychologist trained rats to discriminate between different visual patterns, and he found that the power of discrimination depended upon the activity of the visual cortex. In one case practically the entire visual cortex was removed; indeed, it was estimated that instead of the normal 70,000 only about 700 fibres remained to convey retinal impulses to the cortical remnant. Yet in this animal the simpler integrative processes involved in visual discrimination and learning could still be carried out in practically a normal manner. It would almost seem that even if only one such fibre remained the animal might still be able to make use of this solitary pathway in order to distinguish one pattern from another.

CONTROL OF MALARIA

Progress in the prevention of malaria, like progress in the general public health, has placed an increasing onus upon the individual to play his due part. In the public health it is essential, for example, that the individual himself should know and put into practice the elementary precautions relating to a sufficiency of certain principles in his dietary. Similarly in tropical countries the individual, either in his capacity as an individual or as the responsible head of a commercial or other undertaking, should have at least some knowledge of the principles involved in precautions against malaria and how to put these into practice. In this connexion interest attaches to the issue from the Ross Institute of a *Handbook of Malaria Control*. The author is Dr. R. Svensson, and there is a foreword by Sir Malcolm Watson. This small book of seventy-three pages has been written especially for planters, engineers, and laymen who have to undertake malaria work in the Tropics. Books of this kind intended to be a practical guide rather than a source of general information on the subject dealt with are by no means so easy to write successfully as might be supposed. They often include technical matter which is not really necessary to the book's purpose, and since the reader does not know that such matter is irrelevant he is apt to think that the subject is more complicated than, so far as he is concerned, it really is. He may also possibly waste his time trying to understand and appreciate what is really the business of the expert parasitologist or entomologist. On the other hand, in the attempt to avoid all technicalities a book may come to have merely literary value and be of doubtful utility to the reader who requires actual concrete help in what must, after all, be to a certain extent technical. Dr. Svensson has avoided these defects. The contents of the book are brief, clear, and practical. Matter which it is not really essential the layman should know is omitted or reduced to such short mention as is necessary merely to give an intelligible meaning to some commonly used word or expression which the layman may expect to meet in literature on malaria. After a few introductory pages dealing with control work and explaining some terms, the common methods of control are briefly described. Of these there are now quite a number, and a list of possible control measures against malaria would form quite a formidable statement. Actually the word "control" in the title of the manual is used in the somewhat restricted sense as commonly applied to measures directed more especially against the carrier, or more correctly the vector, species of anopheles, of which larval control is the most usual form. Even so the number of possible methods is considerable, including control by biological methods, or, as these are now usually termed, naturalistic methods; the use of river training and flushing where rivers are concerned, and of damming in certain circumstances; various forms of filling, control of breeding in crab-holes, rock-pools, and tree-holes, each of which may be important in certain areas; and the more generally applicable methods of drainage, oiling, paris-greening, and the use of insecticidal sprays against the adult insect. These last methods are the most fully dealt with in the manual, the section on drainage being well illustrated with good simple diagrams. For oiling the preparation approved by the Institute is an admixture of petroleum oils going under the name of "malariol." In describing the advantages of oiling reference is made to the indirect effects which may be brought about in the biological condition of regularly treated waters and also to the fact that by spraying the banks as well as the water the grass is "burnt" and side pools and seepages remain exposed to view and treatment. At the end of the book are a number of short appendices giving directions regarding the collection, mounting, and dissecting of mosquitos, apparatus required for larva collection, and other information. The publishers are the Shell Group of Oil Companies. In the foreword it is noted that when the intention to publish such a handbook was brought to the notice of the Shell Group they generously volunteered to defray the expense of production and distribution through their world-wide organization if the Ross Institute would be responsible for compiling it. To facilitate distribution over-seas and to avoid duplication the principal offices of the Associated Companies of the Shell Group will hold stocks, and requests for copies should be made direct to these centres. Distribution in the British Isles will be through the Ross Institute, and application for copies should be addressed to the Organizing Secretary at 29, Inglis Road, Ealing, W.5. The first impression is of 6,000 copies.

[5] *Arch. Neurol. Psychiat.*, Chicago, 1940, **44**, 377.
[6] *J. comp. Neur.*, 1939, **70**, 45.

WAR SURGERY: INFORMATION AFFORDED

In an annotation in the *Journal* of August 10 (p. 196) we suggested that it was desirable that some assessment should be made and published by the Army authorities concerning the value of the methods of treatment pursued in the campaign in France and Flanders. The suggestion was not made merely to satisfy curiosity, and scientific exactitude was not expected, but in the prolongation of the war which then seemed, and still seems, inevitable, we thought it would be a great advantage if certain impressions from British Expeditionary Force experience were placed at the disposal of medical men in this country, many of whom might—as has since proved to be the case—find themselves in the front line. It is now a pleasure to testify to the way in which the Army authorities through one channel or another have caused this information to be gathered and given out on all or almost all the several points we mentioned. We suggested that information was particularly wanted, among other matters, on prophylaxis against tetanus, on blood transfusion, and on sulphanilamide packs. Prophylaxis against tetanus was the subject of a letter in the *Journal* of September 14 (p. 364) from Major-General Marrian Perry, who stated that 80% of the B.E.F. were protected by active immunization by tetanus toxoid, and that it was intended that every casualty, irrespective of prior immunization, should receive 3,000 international units of tetanus antitoxin, though in fact this could not be administered in the majority of cases in the circumstances which arose in the campaign. The incidence of tetanus in the present war has been 0.45 per 1,000 wounded, compared with 8 per 1,000 in the war of 1914–18, and the cases have been in individuals who were not actively immunized. The second subject was blood transfusion, and on this Captain W. d'A. Maycock, R.A.M.C., in the *Journal* of October 5 (p. 467) set out some conclusions based on the reports of nine officers in the Army Blood Transfusion Service. The results obtained in suitable patients by the use of blood or plasma were found by these officers to be satisfactory, and in apparently moribund patients often to be amazingly good. Captain Maycock mentioned some technical points which merit notice, and emphasized the need for early treatment of severely wounded men if any success with blood and plasma transfusion is to be obtained. Finally, in the present issue (p. 682) Colonel Leonard Colebrook puts on record some impressions of the use of sulphanilamide packs. They are impressions only, for the prophylactic administration of sulphanilamide either by mouth or by means of the pack was not carried out on any large scale owing again to the difficult conditions which obtained. The impressions, however, are for the most part favourable, and, as Colonel Colebrook points out, with casualties at home it should be much easier to make precise ascertainment of the value of the pack for staving off bacterial infection in recently infected wounds, though the collection of these data will call for co-operation between surgeon and pathologist. It is useful to have these various records, incomplete though they are. The War Office has often been accused of an oyster-like closeness, which may, after all, be a right policy in many fields, but when it comes to matters which are likely to affect greatly the success of the treatment of wounded or the maintenance of the health of Army personnel there is everything to be said for such disclosure of information as has now been made. The policy of the War Office might well be followed by some other Departments. For example, it would be of great assistance to those who are considering and devising methods of protection if the Ministry of Home Security would afford some information with regard to the location and character of the wounds which cause instant death in air raids, the position of the victim when the wound was received, and the nature of the missile. There is abundant information about non-fatal wounds, but the bodies of persons killed outright are rarely seen, we believe, by members of the medical profession.

CHRONIC CARBON MONOXIDE POISONING

Acute poisoning from carbon monoxide inhalation has been recognized for some time, but chronic illness from the same cause is less well known. Further, it is held by many that no permanent injury results from the acute poisoning unless there has been complete loss of consciousness. H. B. Beck, W. H. Schulze, and G. M. Suker of Baltimore,[1] who give some convincing evidence against this view, point out that in certain areas where the regulations governing domestic hygiene are unsatisfactory chronic carbon monoxide poisoning is a domestic rather than an industrial problem, faulty appliances, especially the gas fire, being responsible for a high proportion of cases. The fundamental lesions are due to anoxaemia, and consist of vascular changes in any organ of the body, more especially in the brain and the heart, where they include dilatation of the peripheral vessels, slowing of the blood stream, and increased permeability of the vessel walls, with tendency to haemorrhage, perivascular infiltration, and oedema. The various clinical manifestations of carbon monoxide poisoning are due to widespread lesions of this type, and it is obvious that the clinical picture may be too bizarre and complicated to be sketched easily. Indications of cerebral injury include haemorrhagic encephalitis, hemiplegia, tetanus, epileptiform attacks, visual changes, symptoms resembling those of disseminated sclerosis, and many varieties of emotional, neurotic, and psychotic disturbances, sometimes associated with obvious mental deterioration. The leading cardio-respiratory symptoms are dyspnoea, palpitation, cough, and precordial pain, and coronary thrombosis has been repeatedly observed as a clinical phenomenon. Various degrees of anaemia have been encountered, and in some cases there is "a typical picture of pernicious anaemia"; polycythaemia is found more commonly than a decrease in the number of red cells. Affections of the alimentary system include glossitis, perversion of taste, cardiospasm, pylorospasm, enterospasm, anorexia, nausea, spastic constipation, vomiting, and epigastric pain. In some patients nocturia, dysuria, albuminuria, and glycosuria have been observed, and functional menstrual disorders in the female and impotence in the male are common. With such protean clinical manifestations practitioners may easily fail to consider the possibility of carbon monoxide poisoning, although symptoms in several members of the same family might suggest that the cause is to be found in faulty domestic appliances. The case records which Beck and his co-workers supply show how easy it is to make an error in diagnosis. A taxi-cab driver (his poisoning came from the exhaust gas of a leaky engine) showed multiple lesions at necropsy, which included cerebral changes (thrombosis, arteriosclerosis, and miliary cerebral infarction) and heart disease. He had never lost consciousness, but gradually became incapacitated for work. Only a few weeks before his death he was suspected of malingering. This work has bearing on one of our major health problems to-day—the ventilation and heating of air-raid shelters. The need for keeping a careful watch for chronic carbon monoxide poisoning will be an added task for practitioners this coming winter.

[1] *J. Amer. med. Ass.*, 1940, **115**, 1.

BACTERIOPHAGE FOR STAPHYLOCOCCAL SEPTICAEMIA

Comparatively little has been done in this country in studying the therapeutic use of bacteriophage. The maintenance and choice of strains with an adequate lytic action on individual bacteria demand the constant services of a laboratory specially engaged in this study, and the method is therefore unlikely in any case to achieve widespread adoption. There are two distinct classes of disease in which phage has been used: intestinal infections such as cholera and dysentery, for which it is swallowed; and pyogenic infections, for which it may either be applied locally or administered intravenously if the infection has become generalized. These two classes must be considered apart, because phage preparations contain the products of bacterial lysis; these are antigenic, and if they gain access to the tissues—more particularly if they are injected intravenously—they may exert some influence on antibody production the effect of which cannot be distinguished from that of the phage itself. This has always been a difficulty in assessing the results of treating staphylococcal septicaemia, a favourite field for phage therapy largely because it is so resistant to all other measures. To several previous reports on this subject from the U.S.A. is now added that of A. B. Longacre, H. Zaytzeff-Jern, and F. L. Meleney,[1] which records thirty-six cases of proved staphylococcus septicaemia, all of which were treated by repeated intravenous injections of phage, often culminating in large doses. These authors made tests to determine the potency of the phage used for each patient's own staphylococcus, and have adopted a refinement of this test upon which the principal argument in this paper depends. Not content with the complete clearing of a culture, they plated it in order to determine whether absolute sterility had been achieved. With staphylococci from twenty-one cases these plates were sterile, and only five of these patients died, whereas the mortality among the remainder was considerably higher. Unfortunately for the significance of this observation the plate test was carried out with positive results in only five of these remaining cases, four of which were fatal, and omitted in eight others (among whom were six deaths) whose staphylococci showed complete naked-eye lysis by the phage used for treatment. The authors' conclusion that response to treatment varies with the demonstrable potency of the phage used—a most important piece of evidence of specific action were it fully acceptable—is therefore somewhat insecurely based. While reliance on such figures is to be deprecated, the method is one to be pursued in trying to reach a more certain understanding of the effects of this treatment.

PRIMER ON WOUND INFECTION

The greater part of *War Primer on Wound Infection*,[2] published by the *Lancet*, comes from the facile pen of Mr. Ogilvie, who writes the chapters on surgical principles and practice and also sets out in an admirably clear manner the nature of the problem to be solved. The latter is of special importance, as there are not a few, even among those most nearly concerned, who have little insight into the intricate questions at issue. A sound understanding of our present position can be obtained only if we realize where we stand historically in the evolution of the problem, and so it is proper that the introductory chapter should outline the march of ideas from pre-Listerian times. The brilliance of Lister's researches caused the pendulum to swing too far towards bacteriology to the exclusion of studies of the natural means of resistance. For long it was not recognized that the great value of Lister's work lay in its application to "clean" surgery, and in the tremendous opportunities it gave of extending the technique of surgery safely in directions, already indicated theoretically, which the pre-Listerian surgeon dare not explore on account of the dire results of infection. That wounds in which infection was already implanted constituted an entirely different problem was not at this time fully appreciated, even by Lister himself. Yet, as Ogilvie points out, there were some surgeons whose foresight brought them very close to the truth. The quotation which he takes from the writings of Gamgee in 1887 is worthy of repetition. "The question is not one of antiseptics or no antiseptics, but of the form and proportions in which they should be employed in particular conditions. The great antiseptic is life. The living tissues have a natural preservative power which, if guarded and conserved by the surgeon on physiological principles, offers the surest guarantee for healthy repair which is only an adaptation and extension of normal nutrition." This excellent historical summary traces the effects on surgical opinion of the South African war, of the war of 1914–18, and of the Spanish war, and ends by posing the questions still to be answered. Should all wounds be excised? Should drainage be instituted? Should primary suture be attempted? What is the value of chemotherapy? These and many more await an answer. Colonel Whitby continues the discussion from the biological aspect, and Dr. Cruickshank describes the complicated bacteriology of wound infection. The pros and cons of antiseptic treatment are clearly set forth by Prof. Garrod, and the place of chemotherapy in war surgery, a subject now attracting much attention, is adequately dealt with by Major Buttle. Three short appendices on antisera, burns, and the use of the sulphonamide derivatives complete the *Primer*.

Of less than a hundred pages, the *Lancet Primer* does not pretend to be more than an outline of the subject, but the matter is so well presented that it is bound to be of the utmost value to all who now have to treat infected wounds.

CHANGES AT THE MINISTRY OF HEALTH

Sir Wilson Jameson has been appointed Chief Medical Officer to the Ministry of Health and the Board of Education in succession to Sir Arthur MacNalty, who retires under the age limit. Sir George Chrystal has also retired under the age limit, and is succeeded as Secretary to the Ministry by Sir John Maude; the new Deputy-Secretary is Mr. A. N. Rucker.

Sir Wilson Jameson qualified in 1909, and in his public health career was deputy medical officer of health for the metropolitan boroughs of St. Marylebone and Stoke Newington, and medical officer of health and school medical officer for Hornsey and Finchley. He now relinquishes the posts of medical officer to the Secretary of State for the Colonies, professor of public health in the University of London, and dean of the London School of Hygiene and Tropical Medicine. The position now occupied by this school in medical education is in large measure due to the wisdom, energy, and foresight of Sir Wilson, and these same qualities may be confidently expected to make themselves felt in the Ministry of Health. The medical profession will give its whole-hearted approval to his appointment. Our good wishes go with him in this new office, and to Sir Arthur MacNalty in his retirement.

[1] *Surg. Gynec. Obstet.*, 1940, **70**, 1.

[2] *War Primer on Wound Infection: Its Causes, Prevention, and Treatment.* Edited by W. H. Ogilvie, Surgical Principles and Practice; Robert Cruickshank, Bacteriology; Lawrence P. Garrod, Antiseptics; L. E. H. Whitby, Biological Aspect; G. A. H. Buttle, Chemotherapy. (Pp. 96. 2s. 9d. net, post free.) London: The *Lancet*, Ltd. 1940.

EPIDEMIOLOGICAL REFLECTIONS ON THE AIR WAR

BY

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There is little doubt that during the winter months a large proportion of those living and working in London and some other cities will spend up to half their lives in shelters under conditions of gross overcrowding. Droplet infections will be favoured; it is of interest to try to foretell what will happen, and of importance to examine possibilities of mitigating dangers.

Every reader will react to the last sentence by ejaculating, "Space people out." Were we fortunate enough to possess not one but half a dozen Winston Churchills it might be possible to enforce a redistribution of the people so drastic that the particular risks in question would be small. We are not so fortunate; we must depend on voluntary movement and persuasion. It does not need much imagination to promote a desire for shelter from bombs, but fear of epidemics is remote. Since 1918 our people have had no experience of a terrifying epidemic: simple fear of disease will not shift many families. Let us try to evaluate such data as we have for epidemiological prognosis. I shall consider only cerebrospinal fever and influenza, not because measles, diphtheria, and scarlet fever are unimportant, but because I have no relevant data.

Epidemiological Prognosis

With respect to cerebrospinal fever, we begin this winter in a less favourable position than a year ago: taking notifications as a rough measure of the volume of infection we should have to put this at about five times the amount at that time. In the first quarter of 1940 the regional distribution showed a strong preference for areas where troops were thickly distributed. London and other great cities had considerably less than their arithmetical share of cases. Can we say that the new conditions will change this.

It is true that our well-defined experience of cerebrospinal fever is short—less than 150 years; but, serious as the toll taken has been, there is no instance, I think, of the disease attaining the kinetic energy of scarlet fever, diphtheria, or, of course, influenza, and generating rapidly widespread epidemics—epidemics which produce panic. Some years ago (*J. Hyg.*, Camb., 1931, **31**, 336) I showed that the intragroup spread of measles, probably influenza, was satisfactorily described by the hypothesis that the time during which an infected person was infective was very short and the disease carried on by a chain of recipients. Although the carrier state in cerebrospinal fever is prolonged infective strains may be infrequent, so that the living chain is easily broken. It seems, then, not wholly wishful thinking to believe that, although cerebrospinal fever may be worse in January–March, 1941, than in 1940, catastrophic figures are unlikely.

The case of influenza is, if possible, more conjectural. It is dangerous to say categorically that an influenza of great killing and/or dispersive power must be a "true" virus influenza, but that is a reasonable hypothesis. The influenza of 1940, accounting for, say, six or seven thousand deaths (the exact figures are not available to me), was a minor epidemiological event and not, according to my information, a virus infection. In a mere statistical sense we have no grounds for associating catastrophic influenzas with banal environmental evils. Like the English sweats (themselves, in the view of many epidemiologists, influenzas), and unlike plague or tuberculosis, influenza has not been a *morbus pauperum*, a respecter of the well-to-do and well housed. It does not, however, follow that unsavoury environmental conditions have gone for nothing in the genesis of dispersive influenzas. Hamer and Crookshank urged that influenza had a setting, that signs and portents were manifest before each of the great pandemics. The doctrine which Hamer, whole-heartedly, and Crookshank, with perhaps less conviction, supported of epidemic constitutions has few adherents. Sydenham's changes in the bowels of the earth were rather mysterious and Hamer's cosmic phenomena more so. But the facts used in support of the hypothesis *were* facts—their evidence of strange nervous illnesses, queer localized prevalences of virulent pneumonias, etc. These might point not to the bowels of the earth or the cosmos but to some change in the virulence or dispersiveness of strains of this or that organism due to a disturbed equilibrium consequent upon environmental change. Even before the *Blitzkrieg* we were living in a strange world. The laity, perhaps even our profession, are apt to take short views of epidemiological happenings, to be tacticians rather than strategists.

If by Christmas the public health of London is no worse than now a great many people will laugh at epidemiological forebodings. If we reach Easter without a serious epidemic nearly all will laugh, and a vaguely triumphant and self-laudatory broadcast will be traceable to Whitehall. October, 1918, was a shock to the most experienced officials. In the summer of 1918 I was in charge of the medical statistics of the R.A.F., and in reporting on the summer influenza to my superiors I introduced a sentence (I have forgotten its exact wording, but expect it was vague enough) expressing an opinion that a more serious recrudescence might shortly be expected. I remember that Sir Henry Head, who was chairman of the Medical Advisory Committee, reminded me of this in the dark days of November and asked why I had made the prophecy. My basis was in truth very weak. I was then a more loyal disciple of Sydenham as an epidemiologist than now. I argued that the late summer epidemic was the sign of a new constitution and, having noted that in 1891—a year of pestilence—there was a serious influenza in spring–summer, followed by an almost equally serious influenza within seven months, took this for a precedent. That was quite superficial, but had just the merit of at least trying to link past with present.

Now, in November, 1940, we have behind us a certainly abnormal epidemiological event—namely, the cerebrospinal fever of 1940; but the story of influenza, so far as I know it, has nothing queer in it. Even had I the rashness of twenty-two years ago I should not prophesy disaster.

Evils of Crowd-life

Still, having spent years in watching the epidemiological vicissitudes of herds of mice I am vaguely uneasy. The environmental conditions of those herds, from the point of view of overcrowding, are no longer so grotesque an exaggeration of the evils of human crowd-life as they were a year ago. Our years of study have taught us that in such a herd the epidemiological equilibrium is unstable. Some small change of conditions—perhaps in the rate of recruitment or, in one dramatic instance, a change of temperature—operating upon a community the vital statistics of which have been steady for a long time, is followed by decimation. I hope the analogy may be false, but it seems closer than I could wish.

What can we do, as private medical practitioners—if I may be allowed even in the humblest capacity to include

myself in that honourable company—to mitigate evils but vaguely foreseen? The primary need is to reduce the shelter populations. Wives, mothers, and sisters of indispensable workers are not to be frightened away by vague warnings. Those whose love of family and home triumphs over fear of death in its most melodramatic shape will not heed the warnings of all epidemiologists extant with the illustrious shade of Sydenham at their head. Something might be achieved by telling people the truth or, rather, what each of us holds to be the truth.

What seems to me the truth is that, by staying, the women increase the dangers of life and health which their menfolk run but, as a correspondent of the *Journal* recently pointed out, make the lives of the men more bearable. If it could be arranged to evacuate women and children to districts within easy reach of a city, so near that family reunions were at least weekly possibilities, then spacing out might be psychologically practicable. But many bombs fall upon the outer suburbs, and, presumably, the stronger the inner defences the greater will be the proportion of unloadings upon the outskirts. What is in fact the ratio of bombing risks, how far housing in the outdistricts is or might be made safer than the tenements of slums, are questions no private person can answer.

THE BATTLE-SCARRED "LONDON"

In the board-room of the London Hospital there is a large map of the nine and a half acres covered by the hospital buildings on which at various points are coloured circles enclosing a date; these circles indicate the bombs which have fallen on the hospital. Since the bombardment of London began twenty-one bombs have been straddled across the hospital, including incendiary, high-explosive, and small calibre bombs. Ten thousand panes of glass in the hospital have been broken. Notwithstanding this, 300 beds are in use, and nearly forty blind men from a blind school are being cared for in the hospital. A large first-aid post is also accommodated here. The wards and administrative offices are all shored up, and the hospital activities are concentrated on the first, the ground, and the lower-ground floors. The hospital has its own squad of fire fighters, and for this reason the damage, which might have been much more serious, has been limited. Part of the Medical College has been badly damaged, and the top floor of the nurses' home has been struck by an incendiary bomb, but the rest of the building was saved because of the stone floor at the top. There are 200 casualty beds and 100 beds for civilian sick, but the population of the hospital is kept on the move, and as soon as patients can safely be transported they are sent to a sector hospital; this means that there are always beds waiting for those who need them. Captain Davies, of St. Paul's Cathedral fame, also saved the London Hospital. Digging took place for 18 feet, and ropes were tied round the bomb, but it could not be got out. Captain Davies then found the fuse, built 500 sandbags around the bomb, and exploded it, the only casualty being one pane of glass!

MUSEUM OF ROYAL COLLEGE OF SURGEONS

It has been found necessary to close the Museum of the Royal College of Surgeons until further notice. As a considerable number of the staff are in the Services new specimens cannot be mounted and placed in the Collection. It is also undesirable that valuable material, insufficiently protected, should be allowed to accumulate in the limited storage space at the College. It is hoped, therefore, that those who wish to present specimens to the Museum will retain them in their possession, but notify the Conservator of their intention to present them at a later date. He will be glad to give advice on preservation and storage. To ensure that the colour of the specimen may be retained preservation in Kaiserling I solution is recommended. The colour of specimens preserved in formalin solutions alone cannot be restored before mounting.

GOVERNMENT SHELTER POLICY

Criticism by Professor Haldane's Committee

Following upon the broadcast of the Minister of Home Security on November 3, in which he rejected the idea of universal provision of deep shelters and appeared to take no account of other forms of bomb-proof shelter, a letter has been sent to him by the A.R.P. Co-ordinating Committee, a body of architects, medical men, engineers, and scientists, of which Prof. J. B. S. Haldane is chairman, protesting against the Government's attitude. The alternative policy of scattering the people in a large number of small shelters of the Anderson type, strutted basements, and modified forms of brick surface shelter, supplemented by the strengthening of the lower floors of certain strong buildings, is described by the signatories as totally inadequate. The safety of each individual, they say, is determined not by whether he happens to be with two other people, or with two thousand, but by the construction of the shelter in which he takes refuge—that is, by the thickness of its roof, walls, and floor. Dispersal in small shelters, far from resulting in greater safety, will militate against it. A shelter for five people will, for a given expenditure per head, be far less safe than a shelter for five thousand.

In the view of the committee a realistic policy of bomb-proof shelters will include the use both of tunnel (or deep) shelters and of shelters depending not on depth but on concrete and steel for their bomb-proof qualities. Each of the following forms of shelter must play a part: reinforced concrete shelters, above or below ground, holding from 100 to 1,000 people each (the Haldane shelter); large multi-story reinforced concrete shelters for densely populated areas, an outstanding example of which is the Finsbury scheme submitted to the Home Office before the war; the utmost possible adaptation and extension of existing tunnels, including the driving of tunnels from the most favourable parts of the London tube system; and the construction of new tunnels in parts of the country where soil conditions are favourable. As immediate measures pending such construction the committee urges the conversion of parts of steel or reinforced concrete framed buildings into shelters and the taking over for public use of large and relatively safe private shelters; also the improvement of facilities in existing shelters by the provision of properly designed bunks, mechanical ventilation, adequate sanitation, including the installation of water closets (in place of chemical closets), canteens, drinking-water, first-aid and isolation rooms, adequate lighting, and provision for disinfection. Every possible measure should be taken to make available the adequate production of cement, together with modifications in the priority system, with regard to steel, for example, in order to assure a share of materials proportionate to the importance of A.R.P.

Describing investigations into the properties of glass variously protected, in a recent issue of the *Journal of Scientific Instruments*, Dr. H. Moore states that a sheet of glass of 1/8 in. thickness, if protected by millboard of good quality of 1/16 in., requires before it is fractured two and a half times the force it would require if it was uncovered. In most cases glass bursts outwards. It breaks as a result of being bent inwards during the high-pressure wave, but the segments do not appreciably separate until the pressure excess has given place to the subsequent rarefaction, which occupies a much longer period, and during this period the pieces of glass are sucked forward and fall outwards. Short of blocking up a window with brickwork or enclosing it in shutters of heavy timber or stout steel it is impossible to safeguard glass from fracture. The simplest method of reducing personal injury from flying fragments, and one available for most domestic windows, is the drawing of heavy curtains, which should hang freely so that they can swing inwards. By "lengthening the time of blow" in this way the risk of fragments cutting through the fabric is reduced, and there is a reasonable chance that they may be stopped harmlessly as the curtain swings away from the window. The same applies to wire netting stretched on window frames inside the window some 3 or 6 in. from the glass.

Reports of Societies

TREATMENT OF WAR BURNS

A joint meeting of the Sections of Surgery and of Therapeutics and Pharmacology of the Royal Society of Medicine was held on November 6 for a discussion on "The Treatment of War Burns." Mr. J. B. HUNTER and Sir WILLIAM WILLCOX, Presidents of the Sections, shared the duties of the chair. About 300 members were present.

Surgeon Rear-Admiral C. P. G. WAKELEY said that at the outbreak of the war it was thought that the treatment of burns would be simple and the use of tannic acid was regarded as completely satisfactory. This, however, proved far from true, and in the Royal Navy, where burn casualties had been high, many different methods had been tried and the cases carefully followed up. War burns differed from those seen in civilian life in the respect that the former might not be treated for hours or even days after the injury. On a battleship, tank, or aircraft in action, first-aid treatment of burns was all that could be given in the vast majority of cases, though as soon as possible the cases were transferred to hospitals or hospital ships. Most war burns involved the face and hands, and were caused by gun-flash, bomb-flash, incendiary bombs, and petrol; a smaller number were due to chemicals or electricity. First-aid treatment consisted of morphine, warmth, and fluid by mouth to counteract shock. If shock was very marked plasma transfusion was given. War burns might be considered as those which caused partial skin loss (first or second degree) and total skin loss (third degree). If examination of the burnt area revealed any sign of dermal circulation the burn had probably not passed beyond the second degree.

Treatment of Shock and Toxaemia

Primary shock, the result of the burn, was characterized by a fall in blood pressure, feeble pulse, and cold clammy skin. Treatment should be by a hypodermic injection of morphine, 1/3 grain, repeated in an hour if the pain was not relieved. Secondary shock occurred as a collapse some few hours after the burn. This accounted for quite 80% of the total deaths in burn cases. The most important factor in its causation was the great loss of plasma from the burnt surfaces. Blood became concentrated, and haemoglobin might rise to anything between 105 and 140%. Fluid lost from the blood vessels to the tissues could best be regained by replacing the lost plasma protein. If plasma was given intravenously it raised the plasma osmotic pressure to a value sufficient to restore and maintain the normal distribution of fluid between the intravascular and interstitial compartments. Whole-blood transfusion and intravenous normal saline or sterile water were contraindicated. The amount of plasma necessary must be estimated by frequent blood examinations.

He supported the view put forward by Aldrich that acute toxaemia occurring in burns was due to infection by streptococci. Toxaemia did not appear for several days, and could be prevented by adequate primary cleansing before coagulation was begun. Acute toxaemia was not nearly as constant a feature of the burns treated in the Royal Naval Hospitals during this war as it was during the war of 1914–18, and no doubt coagulation therapy was responsible for the decrease. For extensive burns with toxaemia saline baths had proved most valuable.

Sepsis had proved a real problem in war burns. In first- and second-degree burns it could be prevented provided local coagulation treatment was given directly after the injury and was followed by adequate cleansing and coagulation when the patient reached hospital. When sepsis was present any tan should be removed and saline baths instituted.

Local Treatment

For first-aid treatment a jelly preparation was without doubt the best. He favoured gentian violet jelly with merthiolate (1 in 5,000). This could be applied on to the burnt area without any cleansing whatsoever. The application should be liberal, for it was painless and even soothing. It would seal off the burnt area, and a crust or eschar formed which remained in place until the patient arrived in hospital. Local treatment should not be given in the presence of shock. No tannic acid preparation should be used on the hands and face.

In hospital the treatment of shock was instituted, and plasma banks and dried plasma were playing a very important part. The employment of oxygen administration by the B.L.B. mask had also helped to reduce the death rate from shock. After the shock had been treated the patient was taken to a warm theatre and anaesthetized with gas and oxygen. The whole burnt area was thoroughly cleansed with saline, dried with an electric hair-drier, and two applications of an aqueous solution of triple dye (2% gentian violet, 1% brilliant green, 1/10% neutral acriflavine) sprayed on the surface. This produced a thin supple tan adherent everywhere. The tan became loosened generally about the eighth or ninth day, and gradually fell off, leaving a healed area underneath. If the burn was extensive and mostly or entirely third degree the area should be excised and skin grafted. He considered the use of sulphanilamide when sepsis was present very rarely necessary. With the destruction of skin in third-degree burns a considerable amount of the body's supply of sulphur was destroyed, and the best method of sulphur replacement was a liberal diet of eggs, which could not be taken during sulphanilamide treatment. After the healing of the burn the healed surface which was covered with new skin should be treated by the application of lanoline each day for fully six weeks. The lanoline should be rubbed into the area, and this massage would result in a skin which was more supple and better supplied with blood.

Surgeon Rear-Admiral Wakeley added a few words on the subject of phosphorus burns and electrical burns, and also stated that in the Royal Navy an anti-flash gear was now served out to every fighting ship for the use of ratings who were exposed to gun flash or bomb flash, and its use had resulted in a marked reduction in the number of burns.

Systemic Disturbances in Extensive Burns

Prof. W. C. WILSON said that the cause of some of the systemic disturbances accompanying burns was still a matter of conjecture, and the subject urgently required investigation. Careful study of the clinical condition and pathology of burns was likely to be much more fruitful of advances in therapy than an indiscriminate trial of this or that form of local application. In systemic disturbances local treatment in itself was not effective. It must be combined with general treatment if life was to be saved. Attention had been directed mainly to the effect of the injury on the smaller blood vessels and on their permeability. But there were many other structures which were also affected—for example, nerve terminations and nerve fibres. It was generally agreed, however, that injury to the blood vessels in the affected area was responsible for the collateral collapse which was called secondary shock. Such shock might begin a great deal earlier than had been previously thought. He had known patients admitted within forty-five minutes of the injury begin to show almost immediately a steep fall in blood pressure. Abnormal permeability of the smaller vessels persisted for a varying period.

Shock was usually more profound with the deep than with the superficial burns, though the extent and distribution might be approximately the same. Yet the amount of exudation was probably greater in the superficial burns which affected the skin only than in the deeper burns which penetrated to the less vascular tissues.

Coagulation treatment was used in secondary shock as a preventive measure to minimize the exudation of fluid. It did not stop the exudation, but it did minimize it. It also relieved pain. Whatever the cause of the acute toxaemia, which was still unknown, it had become much less common since the coagulation treatment was instituted. Whether this was due to the inhibition of bacterial growth was uncertain. How did coagulation treatment affect the incidence of sepsis? Sepsis occurred predominantly in a deeply burnt area, and the object in using coagulation, which did not penetrate more than a millimetre of tissue, was to make the conditions as unsuitable for bacterial growth as possible. This was done more effectively by coagulation than by any other form of local treatment.

Combination of Burns and Wounds

Wing-Commander CECIL FLEMMING limited his remarks to the type of case seen in the R.A.F., in which there was a combination of burns and wounds, usually the result of

crashes in which the aircraft caught fire. The problem which the practical surgeon had to face was what to do about the wounds. The ultimate cosmetic and functional recovery depended enormously on early surgical treatment, and probably more so in the face than in any other part of the body except the hands. What sort of anaesthetic should be given the patients? How soon was it safe to give the anaesthetic? It all depended on the shock, which was only another way of saying that it depended on one's own judgment of the particular patient unless some pathological criterion could be found which would give some sort of clue. He had tried using the estimation of the haemoglobin concentration, which almost invariably in burns showed some increase, even, in a severe case, despite the injection of serum, to between 110 and 140%. But haemoglobin concentration, however accurate it might be as a guide, was likely to be affected if the patient at the same time had been wounded and bleeding. Was it in any sense a quantitative guide as to what could be done for the man in the way of surgical intervention? With extensive wounds of the face a mask could not be used; he was rather nervous about trying to pass a tube through the nose in such cases, and was tempted to try intravenous administration.

On the question of shock and toxaemia he found himself going round in a circle. If the man was shocked and wounded his pain could be relieved by surgery, but would surgery increase his shock? He did not think in terms of shock in dealing with these people, but in terms of pulse rate, blood pressure, and body fluids, and he regarded each case as an individual one. He was not able to appreciate the clear distinction between primary and secondary shock which had been described by the first speaker.

Prof. L. J. WITTS sent a note, which was read in his absence, on the effect of serum in a number of cases of extensive burns. The period of danger from shock appeared to be from twenty-four to forty-eight hours; thereafter the danger was likely to be not from shock but from toxaemia or pneumonia.

Skin Grafting

Mr. A. H. MCINDOE said that the treatment of burns was a threefold matter: the saving of life, the local treatment of burned areas, and the preservation of function in the parts involved. Experience of war casualties showed that the easily applied coagulation method so useful in the prevention of toxaemia had been carried somewhat too far, particularly where toxaemia was not in evidence. This was specially true of tannic acid. From a practical standpoint, where the involvement was of the first or second degree the coagulation method gave excellent results provided sepsis could be excluded, and he had no intention of condemning tannic acid whole-heartedly. But where the loss of skin was complete, coagulation of the area might and usually did fail, particularly in regard to ultimate function. In these cases involving the whole thickness of the skin it was impossible to tan or coagulate the entire burnt area. A heavily infected granulating surface was exposed in which healing might be slowly and painfully achieved, and during this phase the patient might become wasted and anaemic from chronic sepsis, broken in morale, and lowered in general resistance, so that any grafting was impossible. Under the unyielding tannic acid oedema could develop to a degree which produced further crippling deformities. In third-degree cases treatment should be directed towards obtaining the best granulating surface to which a skin graft could be applied. He urged strongly that the wholesale tanning of burnt surfaces in third-degree burns, particularly those of the hands and face, should be abandoned. Judgment must be exercised in a careful selection of cases for grafting. He viewed with concern the present unsatisfactory position which allowed valuable personnel suffering from burns to be treated in scattered hospitals, some of which were inadequately equipped for this type of work. He showed slides illustrating the value of the thermostatically controlled saline bath, followed by saline packs, and later the use of Thiersch grafts.

Envelope Method of Treating Burns

Surgeon Lieut.-Commander JOHN BUNYAN showed a cinematograph film illustrating the envelope method which he had devised for treating burns. This consisted in the use of electrolytic hypochlorites in dilute solutions in saline by intermittent irrigation. Specially coated transparent silk envelopes were used to isolate the burns and prevent any form of contamination. He claimed that by this method primary shock was kept at a minimum, tissue and bacterial toxaemia and excessive fluid and chloride loss should not occur, painful dressings with all that they involved were eliminated, and healing without scarring was rapid. The method was simple, needed no special or complicated apparatus, and could be applied without a general anaesthetic on receiving the casualty anywhere in a first-aid station, dressing station, or at sea.

Sir HAROLD GILLIES emphasized the value of team work in dealing with this problem of burns. He felt that there was a case for some other treatment than tannic acid for the hand. The saline treatment was improved possibly by the Bunyan-Stannard envelope. They should also be very grateful to the "serum people" and to those who had introduced the sulphonamide compounds. A new paste had been introduced in Edinburgh containing albucin 5% in glycerin and cod-liver oil and kaolin, which might be of use. Colonel Colebrook had helped in the local treatment of granulating areas by means of sulphonamide powder. It was certainly necessary to get better results with burnt hands and faces.

Mr. VAUGHAN (Middlesex Hospital) said that if a wound—and these injuries should be considered as wounds—were treated by tannic acid it was exactly the same as suturing with a primary suture without drainage. Further, skin, provided it was not completely destroyed, had an automatic power of regeneration. If it was completely destroyed it could only be replaced by granulation tissue and scar tissue or by skin brought from another part of the body. It was important to impress on all concerned that they should go back to the surgical treatment of wounds.

The Local Application of Sulphonamide Powder

Colonel LEONARD COLEBROOK said that sepsis was one of the most important factors in the burns problem, and this resolved itself chiefly into infections by the haemolytic streptococcus. Surgeon Rear-Admiral Wakeley had said that it was rarely necessary to administer the sulphonamides, but in his own view there was great hope in the local application of sulphanilamide either in powder or in some form of paste. He mentioned a number of cases in which, within two or three days of the application, no streptococci remained, and the wound healed within a week. One man had burns on both hands, the left hand being by far the worse as regards ulceration, and it was decided to powder the left hand and to leave the right as a control. In the left hand the streptococci disappeared within three days of starting the powder treatment; the right hand retained its streptococci, and the hand finally healed on the twenty-second day. In all, some thirty-five wounds had been treated by powder once or twice a day, and in only two cases had there been failure to get rid of the streptococcus within two or three days. Recently an air-raid casualty was received with an extensive second-degree burn on the leg, arm, and face. After three days in saline baths it was suggested that it be powdered with sulphanilamide, and within three days all the streptococci had disappeared. He felt sure that many of the second-degree burns in which there was not a great deal of effusion would show the same results. He added that the powder was blown on with an insufflator. It was particularly in cases without a great deal of suppuration or effusion and without sloughs that great improvement might be expected.

Mr. T. P. KILNER said that at the Ministry of Pensions Hospital at Roehampton they had had less experience of burns so far in this war, but such experience as had been acquired bore out what had been stated concerning the crippling effect of burns on the fingers. He asked whether Mr. McIndoe had had the opportunity of treating a primary burn by saline baths, and whether in such a case the fingers did not become attenuated, blue, and fixed. Did he advocate free active movements in the bath? Again, during the stage of grafting, when fixation was presumably absolutely necessary, how did he avoid getting any permanent fixation of joints?

Mr. MCINDOE replied that a number of acute cases had been treated with saline baths from the beginning, and the results had been most impressive. Immobilization was necessary for the graft, but only for seven to ten days, and certainly it did not seem to have the disastrous effect that the early immobilization during the period of oedema and infection was likely to produce in the presence of tannic acid.

Local News

INDIA

Public Health in India

Hitherto the annual report of the Public Health Commissioner on health conditions in India has not appeared until at least eighteen months after the year to which it relates, but it has now been decided to issue a brief review as early as possible after the close of the calendar year, although not all the statistics and other information from the provincial health authorities has been collected. The first of these preliminary reports (Manager of Publications, Delhi) gives what is described as a bird's-eye view of health conditions in India during 1939.

The outstanding feature last year was the large decrease in the incidence of cholera. In 1938, as the result of widespread infection following the Hardwar festival in April, all the provinces in Northern India and the Central Provinces suffered severely from cholera. Deaths from the disease in the Punjab in 1938 numbered 5,670, but in 1939 they numbered only nineteen. The large part that festivals and gatherings of pilgrims play in the spread of cholera is a subject of great concern to the health authorities. Improved sanitation of the villages and towns through which the pilgrims pass is the most effective means of prevention, but it is a slow process, and in the meantime the best practical measure seems to be anti-cholera inoculation. The possibility of compulsory inoculation of pilgrims is being considered.

Of the annual total of six million deaths in India about one-fifth or one-quarter are attributable to malaria. Except for areas 5,000 ft. above sea level and a few widely separated regions India everywhere is subject to malaria outbreaks of varying intensity. In large cities such as Bombay and Delhi there has been considerable success in the control of mosquito breeding, and control measures are also being successfully carried out on many tea and coffee estates and rubber plantations, and in mines, sugar factories, and cotton mills, and on railways. The problem of rural malaria is the most difficult of solution. The general policy adopted by provincial authorities is to attempt to provide an adequate supply of quinine and of cinchona febrifuge, to popularize the use of these drugs, and to provide for distribution by travelling dispensaries.

The greatest source of danger from yellow fever lies in the air traffic passing through the infected regions of Africa. Air traffic from Africa to India passes over the Anglo-Egyptian Sudan, which therefore constitutes the main line of defence against the advance of the disease into Asia and into Europe as well. Under Government rules any person who has been in a yellow-fever area is forbidden to enter British India until nine days after the last date on which he could have been exposed to infection unless he has been previously inoculated or is protected by a previous attack.

Nutritional Surveys

During the past few years more than fifty surveys of the dietetic habits of groups of people in different parts of India have been made. One finding, which simplifies the approach to practical nutrition problems, is that the poor rice-eaters' diet appears to be uniform all over India. The surveys clearly indicate defects of Indian diets and the changes which are necessary to improve them. The results have been published by the Indian Research Fund Association, and should be of value to the authorities responsible for agricultural policy.

Investigations into maternal mortality have taken place in Calcutta and Bombay, and another was still in progress at the end of 1939 in certain of the urban and rural areas of Delhi Province. Puerperal sepsis is the chief cause of maternal mortality, anaemia associated with pregnancy coming next. The incidence of eclampsia and the toxaemias of pregnancy appears to vary geographically; these conditions are relatively rarer in north-eastern India than in the southern and eastern regions. On the other hand, osteomalacia, producing conditions causing difficult labour, appears to have a higher incidence in the Punjab, Kashmir, and north-western India generally. The Advisory Board of Health, consisting of representatives of the central and provincial Governments and of certain Indian States, formed for the discussion of public health policy, appointed a special committee to report on the whole question of child and maternal mortality. Its report has been approved by the Board, and will, it is stated, provide for many years to come a sound basis for the development of maternity work in India.

Research on Epidemic Dropsy

In medical research useful work has been done by the All-India Institute of Hygiene and Public Health, Calcutta, whose report for 1939 has also come to hand (Government of India Press, Calcutta). One of the most important pieces of research has been on the cause of epidemic dropsy, which is still widely prevalent in north-eastern India. It has recently been shown by epidemiological studies and the results of human feeding experiments that the accidental contamination of mustard seed with the seed of a weed, *Argemone mexeica*, which is found wild in the fields where the mustard plant is grown, is associated with the occurrence of this disease. The presence of argemone oil in mustard oil can be demonstrated by colour changes, and suspected oils can easily be tested and prevented from being sold to the public. It has also been shown by experiments on animals that when argemone oil is heated until it "fumes" well the toxicity of the oil becomes reduced to that of plant oils like olive oil or liquid paraffin. If these results obtained on animals are confirmed by observations on man, then the heating of the oil until it "fumes" would be a simple method of controlling the disease. This is particularly important in view of the custom prevalent in Bengal of using raw untreated oil in food and for anointing the body.

The Annual Report for 1939 of the National Institute for Research in Dairying contains a number of items of general interest to medical men. The Institute's herd was examined periodically for the presence of mastitis, and it was observed that *Staph. aureus* was more common than previously noted with this herd, nine cows having excreted the organism in the milk. It was found that bovine tubercle bacilli in butter kept at ordinary room temperature in the summer could not be recovered after fourteen to twenty-one days, and that there was no appreciable difference in the survival time of the tubercle bacillus in salted and unsalted butter. It had previously been found by biological methods that commercial pasteurization brings about a small though definite loss in the vitamin B complex of milk, and that commercial sterilization destroys some 30% of vitamin B_1 but is apparently without effect on vitamin B_2. These observations have been extended by the application of chemical tests, and it has been found that pasteurization destroyed 10% of vitamin B_1, but had no effect on riboflavin. Commercial sterilization of milk destroyed vitamin B_1 to the extent of 50%, but again riboflavin was unaffected. On further investigation of the effect of light on vitamin C in milk in different containers it was found that the effect was least with milk contained in brown glass bottles, then green glass bottles, and then wax-impregnated cartons; in these twice as much vitamin C survived as in clear glass bottles. Experiments with extracts of the anterior lobe of the pituitary of the ox, rich in prolactin and thyrotrophic hormone, have shown that injections of both extracts into cows in declining lactation result in a marked increase in yield of milk, particularly with the prolactin preparation, which raised the average daily milk fat production by nearly 50%. In view of the various biological activities of the two extracts used it was not thought that the results obtained could be ascribed to the action of a single hormone. Promising results have also been obtained by the use of stilboestrol administered in various ways. Inunction of stilboestrol into the udder region of virgin female goats resulted in considerable development of the udder owing to its secretion of large quantities of milk of normal chemical composition. Good results were obtained in treating sterile bulls with chorionic gonadotrophin.

Correspondence

Owing to heavy pressure on space correspondents are asked to make their points briefly. A number of letters received for publication have had to be held over.

Sulphanilamide and Wound Infections

SIR,—Your annotation of August 10 suggested that some statement should be made as to the use of sulphanilamide and its derivatives during the fighting in France and Belgium. I have hesitated to do so, hoping that further evidence might come in from medical officers who had been able to preserve some actual data. That, however, has not happened.

It will be remembered that in the early days of the war memoranda were issued (October 11, 1939, and July 3, 1940) dealing with the employment of sulphanilamide with a view chiefly to the prevention of infections by haemolytic streptococci and by bacilli of the gas-gangrene group. This prophylaxis was thought to be advisable because it was not known with any certainty how much streptococcal infection would occur at the time of wounding. The investigation of such casualties and accidents as did occur during the winter and spring, however, made it clear that these primary infections by haemolytic streptococci were quite uncommon—something like 5% of all injuries with open wounds. The greater number of such infections as did occur usually developed at a later stage—after some days in hospital. The case for the early administration of sulphanilamide for the specific purpose of preventing a streptococcal infection did not therefore appear so strong by the time the May offensive started in Holland and Belgium.

Perhaps for this reason in part, but more on account of the chaotic conditions prevailing during the few weeks of fighting, it is probable that prophylactic administration of sulphanilamide, either by the mouth or by means of a "pack," was not carried out on any large scale. At any rate the data derived from the wounded men's field medical cards were so scanty as to be of very little value, and it was not possible to follow through any series of well-recorded cases. At home, also, during the period of greatest activity, May 25 to June 10, the hospitals were working at such high pressure that it was well-nigh impossible to keep adequate records or to correlate clinical events with bacteriological findings.

Up to the present, therefore, the wounds resulting from land operations have yielded but little precise knowledge as to the potential value of sulphanilamide and its derivatives. The impressions of most observers, however, seem to have been for the most part favourable. Several surgeons who packed early wounds in France and Belgium reported that they remained free from clinical signs of infection while under their care. One series of seven or eight cases so treated came under observation two weeks later at a base hospital. Some of the wounds had healed by first intention, but at least two had acquired a streptococcal infection. (A sulphanilamide pack will usually be absorbed within three days and is unlikely therefore to give any protection against a hospital infection to which the patient may be exposed after four or five days.) One surgeon who "packed" four cases of established gas gangrene in Belgium was very impressed by their unexpectedly favourable course.

With our casualties at home it should be much easier—and surely of great importance—to supplement these impressions by unequivocal data as to the value of sulphanilamide packs for staving off bacterial infection in the recently inflicted wounds. We had commenced such an investigation in France just before the May offensive. At two casualty clearing stations a number of injuries (road accidents, gunshot wounds, etc.) were packed following the usual surgical toilet, and comparison made with other cases similarly treated as regards surgery but with no pack. By repeated bacteriological examinations of such cases at the C.C.S. and after transfer to the base it was hoped to get clear evidence as to the holding up of bacterial growth by the drug. Only about ten wounds so treated were adequately observed until their transfer to England after some seven to ten days. Most of them remained remarkably free from infection—some with severe injuries yielding actually no growth at all up to five days after the injury. Unfortunately we had not at that time records of comparable cases treated by surgical procedures alone. Had the investigation been completed a few weeks earlier and the effect of sulphanilamide packs established, it would have been of the greatest value during the period of fighting when so many of the wounded had perforce to travel for one to three days with little more than a hastily applied dressing, and in consequence arrived at the base heavily infected.

To get the required data will demand close co-operation between individual surgeons and pathologists; and in view of the fact that a careful surgical toilet will in itself have a considerable effect in checking the development of a bacterial infection, I would suggest that observations should be made if possible upon more or less comparable pairs of cases—for example, two flesh wounds of the calf or two compound fractures of the forearm, both cases being dealt with surgically by the same surgeon and only one of them packed with sulphanilamide. By daily film and cultures the pathologist will readily detect any considerable effect of the drug.

If, as I suspect, the inhibitory action of the pack is established by such a controlled investigation it will surely give us guidance of incalculable value for the management of both civil and war injuries. It will show us how to hold off infection in the patient who cannot have immediate surgical attention on account of shock, or transport difficulties, or pressure of work in the hospitals; it will probably diminish very much the risk of suppuration following débridement; and will enable suture to be successfully performed much more often than has been possible heretofore.—I am, etc.,

LEONARD COLEBROOK.

Cerebrospinal Fever

SIR,—I was very interested in Lieut.-Colonel R. W. Cushing's article on cerebrospinal fever (October 5, p. 439), but my experience with sulphapyridine soluble (dagenan sodium) has not been the same as his. He says at the bottom of column 1 on page 441: "There are very grave drawbacks to the intramuscular route in the administration of this drug." I have had a good deal of experience with the use of this drug in cases of cerebrospinal meningitis of all types of severity; in fact I have given it in all cases where vomiting is troublesome and in all cases with delirium, both in children and in adults of both sexes. It is given into the gluteal muscles without any particular precautions, though at first I was careful to wash through the needle as recommended. I have now given this up, as I find that I have had no complications of any sort resulting from these injections. The injection certainly causes pain, but this does not appear to be very severe, as it has always been easily borne by the patients.

It would be interesting to hear the experience of others who have given sulphapyridine soluble by the intramuscular route, as this drug in my experience is most valuable in the treatment of cerebrospinal meningitis.—I am, etc.,

W. F. CORFIELD,
Medical Officer of Health.

Colchester, Nov. 4.

The Mobile Unit in Action

SIR,—An appeal for the experiences of medical officers in charge of mobile units has been made by Dr. G. O. Barber (October 12, p. 507). Although my unit has not been on active work, perhaps my experience may be of interest to those concerned with the organization of these units. The unit is usually stationed at the first-aid headquarters, and the whole-time personnel sleep there during their period of night duty: one week on and two weeks off. In addition, there are unpaid volunteers who are available if necessary. The main criticism against mobile units is that operative measures should never be undertaken without thorough treatment for shock. It is evident, however, that among air-raid casualties there is a large proportion of cases which constitute minor surgical emergencies. For these prompt treatment is desirable and can be made available if adequate preparation is carried out by training personnel and maintaining equipment in readiness. There are, of course, major casualties for whom, although extensive surgical intervention may be necessary, removal to hospital and treatment of shock is the first essential. At the

other extreme are the minor cuts and bruises which are suitably dealt with at first-aid posts.

The outskirts of this town are somewhat scattered, and to serve these areas the medical officer of health requested me to organize what was virtually a mobile first-aid post. During practices and experimentation with the equipment at my disposal my attention was drawn more and more to that class

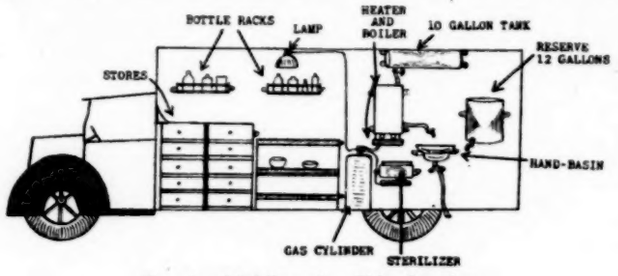

FIG. 1.—Mobile unit. Side elevation.

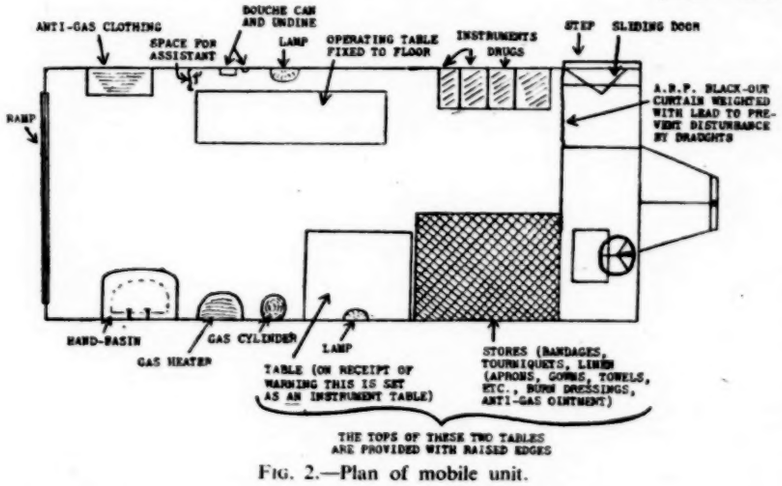
ANTI-GAS CLOTHING
SPACE FOR ASSISTANT
DOUCHE CAN AND UNDINE
LAMP
OPERATING TABLE FIXED TO FLOOR
INSTRUMENTS DRUGS
STEP
SLIDING DOOR
A.R.P. BLACK-OUT CURTAIN WEIGHTED WITH LEAD TO PREVENT DISTURBANCE BY DRAUGHTS
RAMP
HAND-BASIN
GAS HEATER
GAS CYLINDER
LAMP
TABLE (ON RECEIPT OF WARNING THIS IS SET AS AN INSTRUMENT TABLE)
STORES (BANDAGES, TOURNIQUETS, LINEN (APRONS, GOWNS, TOWELS, ETC., BURN DRESSINGS, ANTI-GAS OINTMENT)
THE TOPS OF THESE TWO TABLES ARE PROVIDED WITH RAISED EDGES

FIG. 2.—Plan of mobile unit.

of "in-between" cases which are not major casualties, and although beyond the scope of first-aid posts they merit prompt surgical attention. Recent events have shown that evacuation of casualties in large numbers from a bombed area is not always possible. With the development of air raids increasing in duration and intensity this difficulty will become more formidable. At the same time the class of minor surgical emergencies will increase in numbers.

With these considerations in view it was found that the mobile unit could be prepared more adequately for use as an emergency operating theatre by various alterations. For example, much of the training of first-aid personnel was carried out actually in the unit itself. During the winter months this frequently involved working under black-out conditions. Light was at first dependent upon the electric batteries, which could not stand up to prolonged use without having the engine running. This was a constant irritation by causing vibration, and was excessively wasteful of petrol. Exercises, using oil or spirit stoves to sterilize instruments and provide hot water, proved that this method of heating created a definite problem in relation to ventilation. This difficulty was eventually solved by the installation of a gas system. By this means a continuous supply of hot water was made available, together with arrangements for sterilizing which could be switched on as required. The gas is stored in a cylinder, which lasts a surprisingly long time. Incidentally, lighting is also provided by this means, and altogether this system, besides being cleaner and more efficient, is considerably more fool-proof than any other method we have used.

In conclusion, one detail of construction may be of interest. The rear end of the unit has been designed to let down as a ramp. This enables stretchers to be carried up into the unit without complicated manœuvres on the part of the bearers. The two illustrations show how the interior of the mobile unit is equipped.—I am, etc.,

Oct. 11. D. NOEL JACKSON.

Anaphylaxis after Injection of Tetanus Toxoid

SIR,—The occasional occurrence of anaphylactic symptoms of varying degrees of severity during immunization with tetanus toxoid has attracted attention. The subject has been discussed and cases reported in the *Journal* recently by Air Vice-Marshal H. E. Whittingham (February 24, p. 292) and by Drs. H. J. Parish and C. L. Oakley in the same number (p. 294), and by A. A. Cunningham (October 19, p. 522).

There can be no doubt that the anaphylactic reactions were due to sensitization to Witte peptone or other protein substance in the culture media from which the toxoid is prepared. Whittingham says, "It is desirable that all who use tetanus toxoid should realize that the occasional case may suffer from peptone shock, and should be prepared to treat it."

But why should toxoid be chosen for immunization when alum-precipitated toxoid is a more potent immunizing agent and quite free from this objection? Anaphylactic reactions after injections of toxoid have been recognized for several years. When diphtheria toxoid was extensively used in immunization it was found that unpleasant reactions occurred in a good many cases, especially in older children and young adults, and that they were the result of sensitization to peptone or perhaps other protein substances in the culture media. The pseudo-reaction in the Schick test was attributed to the same cause. Sensitization was detected by the reaction to an intradermal injection of 0.2 c.cm. of diluted toxoid (Moloney's test).

Alum-precipitated toxoid (A.P.T.) is prepared by treating toxoid with 1% solution of alum; the resulting precipitate is then thoroughly washed until all traces of peptone or other foreign protein have been removed, and is then suspended in sterile saline. A.P.T. was found to be relatively much more potent than untreated toxoid in immunization against diphtheria, and even a single injection was considered by some to be more effective than the three injections of toxoid which were usually given. This is attributed to its slower absorption with consequent prolongation of the antigenic stimulus.

A. T. Glenny (*British Medical Journal*, 1930, **2**, 244) investigated the immunizing properties of tetanus alum toxoid on guinea-pigs and horses, and found that the use of A.P.T. in the place of untreated toxoid doubled the value of the antitoxin produced. Petrie adopted this method in the hyperimmunization of horses for tetanus antitoxin, giving one injection when the horse arrived at the stables, repeating the injection after a month's rest, and subsequent inoculations were given at intervals of six months. D. H. Bergey (*J. infect. Dis.*, Chicago, 1934, **55**, 72) obtained much better results with alum-precipitated toxoid both in guinea-pigs and in men. The method adopted in human immunization was to give two doses of a potent alum toxoid at intervals of three to six months. The response to the second injection after three months was found to be ten times greater than when the interval was only six weeks.

Why should not alum-precipitated toxoid be used instead of toxoid for the immunization of soldiers or civilians, with an interval, if possible, of three months between the injections, which might be combined with anti-typhoid vaccine? (*British Medical Journal*, 1937, **1**, 494).—I am, etc.,

Worthing, Oct. 28. HERBERT H. BROWN.

Immunized Persons as Diphtheria Carriers

SIR,—I would like to bring to your notice a case I had in my practice which, I think, will be of general interest to every practitioner in this country. I was called in to a child, aged 5, with a history of bleeding from his nose and soreness of the right nostril. The child was quite well generally, the temperature was 99°, and there was a crust formation of the right nostril with slight discharge. A nasal swab taken proved diphtheria bacillus (Klebs-Löffler) positive. The child was given diphtheria antitoxin and removed to the isolation hospital.

In the same house there was living another family with three children, aged 13, 9, and 5. The oldest, a boy, had diphtheria five years ago and the other two children, both girls, had been vaccinated (immunized) against diphtheria four years ago. After the occurrence of the case of nasal diphtheria in the same house all three were swabbed, with the result that the boy who had had diphtheria was negative, whereas the other two girls were positive, without actually showing any signs of the disease; in other words, they were carriers.

The conclusion drawn from these cases is that, while the child who had gone through an actual attack of diphtheria was completely immune against it and proved negative, the other two children, who had been vaccinated against the disease, were immune against contracting diphtheria although they carried the organisms in their noses. This is to say that a person immunized against diphtheria, while himself immune against the disease, can act as a carrier and spread the disease among others and so prove a great danger.—I am, etc.,

Spennymoor, Co. Durham, Nov. 3. E. BRAUER.

Adrenaline in Asthma

SIR,—Many practitioners will be interested in the letter of Sir Arthur Hurst (September 7, p. 337) advocating the use of small and oft-repeated doses of adrenaline in the treatment of status asthmaticus. This method has become fairly well known in recent years, but the fact that many other methods have been evolved during this time indicates that there are others who, like myself, have found that this treatment is not as uniformly successful as Sir Arthur Hurst would suggest.

There is a type of status asthmaticus which is adrenaline-fast in the same sense that there is a diabetes which is insulin-fast. A brief review of the pathology of the disease will perhaps explain why. An attack of asthma is characterized by two main changes in the bronchioles—oedema of the mucous membrane and contraction of the bronchiolar musculature; in status asthmaticus there are present in addition plugs of tough mucus which block the lumina of the tubes. Cyanosis, lowered blood pressure, greatly reduced vital capacity, tachycardia, and distension of the right side of the heart are characteristic of severe asthma. The latter may be improved by adrenaline; obviously the plugs of mucus will not be dislodged, and persistence in its use serves only to aggravate the discomfort of an already distressed patient. It was for this type of case that the method was devised, while working under the supervision of Dr. James Adam at Stobhill Hospital, of administering intravenously fairly large doses of sodium dioxide in glucose-saline solution (see *Asthma and the General Practitioner*, by James Adam). Recently, following the suggestion of American workers, I have seen gratifying results with the slow intravenous administration of theophylline ethylene-diamine (aminophylline). Injection of adrenaline is a palliative for the symptom "asthma" but does not cure the underlying disease. Reliance on it is, indeed, apt to have the opposite effect, as the pitiable state of some patients proves. Adrenaline by subcutaneous or intravenous injection, or by inhalation, still remains the stand-by for the asthmatic paroxysm, but there are occasions when it fails and other substances must be tried.—I am, etc.,

Glasgow, Oct. 21. GEORGE KRASNER.

National Dried Milk

SIR,—Your reply to Dr. A. G. Watkins on the subject of national dried milk (November 2, p. 612) seems to take no account of the main point of the letter—this is, that "if mothers are to obtain dried milk free of cost they must perforce use this preparation." The national dried milk is a full-cream milk, and, as Dr. Watkins points out, this is not suitable for all babies. Most of us who do infant welfare work find that the majority of babies under 3 months old thrive better on half-cream milk, and yet nothing but full-cream national dried milk is obtainable under the scheme free or for 2d. a pint of milk.

It is, of course, true that half-cream and other modified dried milks can still be bought in shops and at a reduced price at welfare centres, but the cost of a clinic package, representing rather less milk than the package of national dried milk, never averages less than 1s. 7d. It seems unfair that a mother who is entitled to free milk should have to pay this simply because there is no national dried milk suitable for her baby.

Before the introduction of the Government scheme local borough councils, in their provision of free milk for necessitous cases, allowed the welfare doctors a choice between fresh milk, full-cream and half-cream dried milk. It would seem that the provision of a standard full-cream dried milk as the only alternative to fresh milk is a retrograde step in infant welfare work.—We are, etc.,

EVELYN M. PAKEMAN,
EVELYN T. D. MACLAGAN,
Medical Officers, West Islington Welfare Centre.

Nov. 4.

Oedema of Legs following Fixation of Chest

SIR,—In the report by Drs. B. Hirsh and R. Ellis (November 2, p. 593) of oedema of legs and ankles in two elderly men following several weeks of strapping of the chest for fractured ribs a mechanical cause is certainly indicated, and some experiments made by me in 1913 may be of use in explaining the oedema. These were done partly to determine the changes in leg volume with attitude and body movements. A simple plethysmographic device was used, consisting of a broad rubber collar or bag connected up with a long U-tube containing Fleuss oil to serve as a manometer. The collar was applied round the calf of the leg and moderately distended with air.

The effects of respiratory movements are chiefly relevant here. So far as these were concerned, it was found that the leg volume was least when the thorax was in a position midway between inspiration and expiration. Taking the level of the column of oil in this position of the chest as a base line, there was a rise of as much as 5 cm. from this point on full inspiration, as compared with 3 cm. on full expiration. This result followed what one might call normal breathing of the male type. On the other hand, thoracic breathing, with the diaphragm used as little as possible, caused only a trifling rise, much the greater part of the increase of leg volume being found due to the increased air pressure in the abdomen. In other words, the effect of this increased pressure is not only to force venous blood towards the heart but at the same time to hinder the venous return from the lower extremities. In agreement with this were other findings, such as the marked effect of moderate hand pressure on the abdominal walls (the breath being held), also of twisting the body, leaning forward, etc. Where, as in these cases, the subject is more or less restricted to abdominal breathing for several weeks together he might well, therefore, show some evidence of venous stasis by the end of that time.—I am, etc.,

Preston, Nov. 4. EDMUND HUGHES.

Physical Training

SIR,—I am delighted that Colonel Wand-Tetley (October 19, p. 536) has been constrained to answer my letter on physical training in the Army so that a debate on the whole subject of physical culture and training may now take place in its proper place—a medical journal. But before discussing this may I suggest that all the improvement in the recruit's physique and appearance is not due entirely to his physical training, but that much of it is due to his ordered life and its discipline and to his excellent food and provision for all his needs, while all that is required of him during his training is to learn his job and do his duty. If everyone in the country lived under the same conditions, what a difference it would make to the personal appearance and internal happiness of thousands!

The analogy between the head and the hand in their relationships to their respective joints, as it affects their essential functions, is very close. By the essential functions of the hand I mean the innumerable uses to which the intrinsic muscles of the hand can be put, apart from the uses of the hand as a fist or the supporting and moving functions of the arm and forearm. By the essential motor functions of the head—the cephalic globe—I mean the delicate movements of the head at the atlanto-occipital joint, not at any intervertebral joint, carried out by the intrinsic muscles of the

head—the suboccipital muscles called by Dr. Cave "the handmaids of the cephalic globe." These movements are apart from the supporting and moving functions of the large muscles in the neck.

When the head is extended on the spine it is not in its normal anatomical relationship to the atlas at the atlanto-occipital joint. It is pointing backwards and inclining downwards, even in the position of attention of the Army physical instructor as shown in the *Manual* of 1931. It should be directed forwards and upwards, and because this is not so the action of the intrinsic muscles of the head are interfered with, and the functioning of the head as primary control is consequently altered, just in the same way as the functioning of the intrinsic muscles of the hand are interfered with when the hand is extended on the forearm.

The position of the head has been shown by numerous physiological experiments on mutilated and decerebrate animals to determine the relative position of the different parts of the body to each other and to itself, but no physiologist has attempted to show how the position of the head relative to the spine in a normal intact man alters the relationships of the different parts of the body to each other and to itself. If it is true in the experimental animal it must be true in the intact animal (even man), as witness the effect of putting a bearing-rein on a horse. What happens then if the muscles of the neck are contracted and the head drawn back—as with the bearing-rein in a horse? The spine is shortened, the shoulders are drawn back, alignment of ribs altered, the shape of the chest changed and made pouter-shaped, and the breathing space restricted; the back is hollowed and the supporting action of the abdominal muscles disappears as the anti-gravity function of the muscles is negatived throughout the whole muscular system.

I wish to point out that this letter is meant to provide a basis for a real constructive system of physical culture and physical training and not simply a destructive criticism.

Since writing the above I have been in communication with Colonel Wand-Tetley and he informs me that since July the Army physical training methods are being based on the principles described above.

These principles have been set out by F. Matthias Alexander in his books, *Man's Supreme Inheritance* and *Constructive Conscious Control*, while the experiments on himself, on which the principles and technique are based, have been described in his book *The Use of the Self*. This was done without any anatomical or physiological knowledge—the attempt to supply which has been made by myself.

Bexhill-on-Sea, Oct. 28. A. MURDOCH.

Cut Fingers in Factory Workers

SIR,—I am in complete agreement with Mr. A. Wilfrid Adams (November 2, p. 614) in his plea for early recognition of cut flexor tendons in the fingers of factory workers and in the necessity for efficient treatment. His statement that prompt tendon suture is as easy as it is successful seems to be misleading in two respects. If accepted at its face value the inexpert may be tempted to undertake suture without full aseptic ritual, which, I am sure, is far from what Mr. Adams intended. The results of flexor tendon suture in the hand, performed under the best possible conditions, have always been disappointing to me, and at the present time, with such accidents on the increase, I am sure there are many of your readers who would be glad to hear if Mr. Adams has a technique which is giving improved results following this slight but extremely disabling accident.—I am, etc.,

Liverpool, Nov. 4. W. R. D. MITCHELL.

SIR,—I was interested in the letter by my friend Mr. A. Wilfrid Adams (November 2, p. 614) on primary flexor tendon suture. Mr. Adams concludes that "prompt suture is as easy as it is successful." My own experience and that of colleagues with whom I have discussed the matter has been otherwise. Whereas the latest method of incision for drainage of a thecal whitlow would appear to offer great prospects for subsequent movement in the affected finger, I have never had the good fortune to see mobility restored to a flexor tendon which, after severance within its sheath, has been sutured primarily or otherwise. Some surgeons in despair have even resorted to primary amputation. As severed flexor tendons are of daily occurrence, it may be that Mr. Adams has a suture technique which results in success where others have failed. I write this letter in the hope that Mr. Adams will give his technique in a further communication.—I am, etc.,

Sheffield, Nov. 5. H. BLACOW YATES.

Medical Education under Air-raid Conditions

SIR,—I may perhaps be allowed to repair an omission in the account published in your issue of October 26 (p. 567) of the way in which the medical schools of the University of London are carrying on under war conditions. Upon the outbreak of war the Faculty of Medical Sciences at King's College transferred its activities to the University of Glasgow under the scheme of evacuation which had been formulated by the Committee of Vice-Chancellors and Principals. This scheme, owing to the information then available of the intentions of the Government with regard to conscription, made no provision for students preparing for the First Medical Examination. Thanks to the very great kindness of the University of Leeds arrangements were made for the teaching of this category of student at Leeds during last session. To the University of Glasgow the College is deeply indebted; nothing could have exceeded the generosity of its hospitality and the ungrudging helpfulness of all its members. Certain practical difficulties, however, inevitably arose from its remoteness both from London and from Bristol, whither the other Faculties of the College had been dispersed. It was decided, therefore, to take advantage of the offer of the University of Birmingham to occupy a part of its magnificent new medical school. In August the Faculty was transferred to Birmingham, and there was held the extra vacation term authorized by the Senate of the University of London in order to shorten the period necessary for the students' qualification. At Birmingham it has proved possible also to provide for students preparing for the First Medical Examination. In Birmingham the Faculty has found friends not less kind than those in Glasgow, and the Michaelmas term opened on October 9, when 208 students were in attendance.—I am, etc.,

W. R. HALLIDAY,
Principal, King's College, London.

The University, Bristol, Nov. 4.

Children in Air-raid Shelters

SIR,—The medical profession will be wanting in its duty to the country if it fails to force the Government to take immediate steps to end the intolerable position of children spending their nights regularly in these air-raid shelters. It is extremely bad for the nation's future that this state should be allowed to go on. If the parents cannot, or will not, evacuate their children, then it is the obvious duty of the Government to do so. Accommodation must be found for these children in districts where there is little or no risk of air raids. Children need proper sleep at night, not herded together, as in these underground shelters; and they must not be forced to spend all these hours below ground.

It is no doubt true that grown-up persons can stand this air-raid shelter life better than children, but they too should be given facilities for sleeping away in safety at frequent regular intervals.

The cost of all this must be paid for by the State, as the health of the children and the workers in time of war is of the utmost importance, so that the latter can maintain the highest war effort.—I am, etc.,

Huyton, Lancs, Nov. 6. SYDNEY GORDON TIPPETT.

Educative Function of the Tonsils

SIR,—May I add a corollary to the valuable article by Mr. T. B. Layton on evacuee's sore throat (October 19, p. 531), for it contains new evidence in support of views which I have long held—that a main function of the tonsils is to educate their lymphocytes to know the flavour of the hostile germs of the outer world, and thus be enabled to manufacture appropriate antibodies for their destruction. For Mr. Layton finds that young country nurses coming to London, or city children evacuated into the country, are liable to a series of

sore throats which receive from tonsillectomy none of the benefits to be expected, but rather the reverse. Hence he advises that tonsillectomy should be deferred in such cases for two years till the tonsils have become accustomed to their new surroundings.

Surely the natural explanation of these observations by a high authority is that the tonsils act as educative establishments for their contained lymphocytes, which take some two years to be re-educated against the new germs of a new environment. (We remember the frequency of throat infections in visitors to Swiss hotels—the meeting-place of germs of international variety—and also those which follow the importation of a new germ into a hospital ward.)

The body may be regarded as a fortress with an epithelial wall impermeable to germs. Hence the defending army of lymphocytes can so rarely become acquainted with the germs of the outer world that they can hardly learn to prepare the suitable antibodies. But the narrow crypts of the tonsils (bare of epithelium) can act like turnstiles to allow the germs to penetrate deeply among the lymphocytes—one by one and day by day—where they can be sampled with little risk. And if the mother cells of the lymphocytes are thus educated in immunity they will transmit (by subdivision) their "knowledge" to their daughter cells indefinitely.

Just as the tonsils are sited strategically for the oral and respiratory germs, so are the lymph nodes of Peyer's patches and of the appendix sited advantageously to sample the very different germs which may attack the food canal. Hence neither appendix nor tonsils are missed if they are excised *after* they have provided education against the current germs. If excised in infancy the result might be disastrous, though the army of uneducated lymphocytes in the thymus may act as a temporary makeshift.

These views, though theoretical, seem to be inherently probable and to throw much light in dark places. I have found no evidence against them, and none was urged when I published them long ago in your columns.—I am, etc.,

Hull, Nov. 7. F. C. Eve.

Traumatic Chylothorax

Sir,—Until I read the article by Mr. C. J. Cellan-Jones and Dr. William Murphy (November 2, p. 590) I did not realize that traumatic chylothorax is such a rare condition as it appears to be from the paucity of cases recorded in the literature. I had a patient with this condition under my care several years ago. The patient, an adult male, had sustained a stab wound at the root of the neck on the left side some time previously. His chief complaint was of dyspnoea. There was evidence of a left-sided pleural effusion, and on aspiration a milky-white fluid with all the characteristics of chyle was withdrawn. Dyspnoea was relieved; the patient refused further treatment and left hospital. I do not know his ultimate fate, but his general condition was surprisingly good while in hospital. Presumably there was only a partial severance of the duct and some of the chyle was reaching the circulation. The duct frequently divides into several channels before entering the left innominate vein, and some of these may have escaped injury.—I am, etc.,

Edinburgh, Nov. 9. Douglas S. Robertson.

Prognosis of Schizophrenia

Sir,—Apropos of your leading article on this subject (October 19, p. 526) and Dr. Ian Skottowe's letter (November 2, p. 613) I would like to point out that there is a group of cases often included in the schizophrenias which could be more usefully labelled "reversible schizophrenia." These cases belong, in my opinion, to a group of which anorexia nervosa is one variety. Notwithstanding recent conclusions of the English school, the relation of endocrine dysfunction in this disease is still an open question. Other varieties of this group, which always include amenorrhoea in young girls with transient or negligible degrees of anorexia, show mental confusion with obsessions, or negative tendencies with paranoidal behaviour. These cases all begin at puberty, and are associated with mental distress and malaise, especially a feeling of being "clogged up." Acne is often prominent and mentally distressing. The physical basis is probably endocrine imbalance, which may or may not right itself in time. Mentally the symptoms will clear up or not at all, depending on a number of factors. Clouston paid much attention to similar cases and called them the "insanity of amenorrhoea" and the "insanity of acute suppression of menstruation." If we could widen Clouston's concept of adolescent insanity to include all quasi-schizophrenic behaviour in people under the age of 35, perhaps the labels "schizophrenia" and "dementia praecox" would acquire more exact scientific meaning. The definitions of schizophrenia and dementia praecox as such are clear enough; it is the application which requires elucidation.—I am, etc.,

County Mental Hospital, Newport, Isle of Wight, Nov. 4. Alexander Wood.

Our Unused Influence

Sir,—I had almost given up hope of the B.M.A. and of our profession generally in regard to the war when I read Dr. George H. Alabaster's letter (October 12, p. 507) and the subsequent letters of Dr. A. J. Brock and of Dr. F. Parkes Weber (November 2, p. 614). You are indeed to be thanked for publishing them, and I hope that a nucleus of opinion will form round them which will grow into something more productive of good than the interminable articles and letters about war wounds and casualty organization with which your columns have been filled in the last twelve months.

In spite of Dr. Parkes Weber's misgivings about the morals of our profession, I think it remains true that the mass of mankind expects something better from doctors than mere patching up, and also attributes to us the virtues of generosity and forethought which Dr. Alabaster, along with all profound philosophers, declares to be necessary. Our failure to give a lead in the maintenance and construction of peace will surely be remembered in the emotional revulsion from present courses which is bound to occur sooner or later.

Surely the time is ripe for free discussion at medical meetings throughout the country of war as a social disease. The scales should have fallen from many eyes by now.—I am, etc.,

Birmingham, Nov. 3. Fauset Welsh.

Sir,—Dr. George H. Alabaster (October 12, p. 507) complains that the professions have not used their influence for peace. I can assure South Africa that there has never been any need to preach peace here. If there ever were any doubtful people, the last war cured them. It is now history that some years ago, when Germany was re-arming rapidly, no politician dare go to the country with a programme of re-armament. Later, it is a paradox that when ultimate conflict seemed inevitable the same casual, peace-loving people had to use every means possible to get successive Governments to re-arm, the politicians hoping and praying that international friendship would prevail against resort to war.

In the case of Germany it is the very essence of the Hitler regime that any "influence" or propaganda shall come from Hitler alone, and no one else. Any mention of the virtues, other than those permitted (usually in praise of Adolf!), means a possible firing party or the horrors of the concentration camp.

With due respect to Dr. F. Parkes Weber (November 2, p. 614), I cannot accept his *ex parte* statement that British citizens have been imprisoned for their activities in endeavouring to promote a peaceful understanding between nations. Ridiculous! If they have lost their freedom temporarily, and are enjoying free rations and hospitality, almost certainly in reasonable comfort, it is for the common good, including probably their own. If they are real patriots and good Britishers they'll grumble and stick it!—I am, etc.,

Shrewsbury, Nov. 4. Albert Nicholls.

Sir,—Despite a careful reading I remain puzzled as to what Dr. F. Parkes Weber's letter (November 2, p. 614) really signifies, and in order that I may obtain "a measure of understanding" I must ask him to tell us precisely who are these citizens of "good faith and patriotism" who have been imprisoned. Surely Dr. Parkes Weber cannot be referring to Mosley and certain others of our own brand of "Lavals" and "Quislings." If this is so, is it in respect of these gentlemen that Dr. Parkes Weber asks us to use our

influence in ridding "politics of hypocrisy, lying propaganda, violence, jealousy, hatred, and greed"? Am I wrong in suspecting that Dr. Parkes Weber, at this hour and after all we have seen and experienced, has the hardihood to suggest that we should now do a second and a greater Munich? Perhaps Dr. Parkes Weber will enlighten us.—I am, etc.,

London, N.W.11, Nov. 4. J. SHEPHERD.

Treatment of Appendicitis

SIR,—From the letters once more figuring in the correspondence columns of the *Journal* it would appear that there is still a regrettable failure to appreciate the condition of appendicular obstruction. The late Sir David Wilkie, who did so much to spread the knowledge that acute appendicular obstruction and acute intestinal obstruction were equal surgical emergencies, expressed his belief that practitioners were beginning to recognize this condition, and hurrying into hospital for operation cases of acute appendicular obstruction in the early afebrile stage when operation is so easy and so safe.

Few will argue with Dr. J. Price Williams (September 14, p. 367, and November 2, p. 612) and Dr. Josiah Oldfield (October 12, p. 505) on their pet theories, but when the theory so takes hold of its originator as to lead him to inflict it upon his patients in the form of castor oil it is surely time some challenge was made to these practitioners who advocate such retrograde steps. After Dr. Oldfield's treatment, which includes castor oil and olive oil, t.d.s., he states that so far he has not had a case of appendicitis that has needed operation. I would suggest that after a week of such treatment for obstructive appendicitis the patient certainly would not need operation, having passed far beyond the aid of the surgeon out of this troubled world.

To the patient with a concretion impacted in the appendix and distal to which tension within the lumen is increasing with coincident progressive vascular embarrassment in the wall, even a single dose of castor oil might be sufficient to precipitate appendicular rupture and the escape of highly infectious content into the unprotected peritoneal cavity.

It would be well if every medical man carried in his mind the picture of the distended obstructed appendix with its foul faeculent content, and realized that it is his responsibility to see that that appendix is removed before rupture occurs. To give castor oil to such a case would be on a par with the administration of thyroid tablets to help a patient through the crisis after thyroidectomy!—I am, etc.,

Rotherham, Nov. 3. JOHN A. BATY.

Closed Plaster Technique for Infected Fractures and War Wounds

SIR,—We agree with Mr. R. Watson-Jones (November 9, p. 648): it is important "to pay credit where credit is due." He is right in ascribing the closed plaster treatment to Winnett-Orr; Trueta does the same (vide his manual on the *Treatment of War Wounds and Fractures*, p. 13), and in the most generous terms.

Then Mr. Watson-Jones adds: "Trueta did not develop the technique." Perhaps he would agree that he applied it most successfully and on a very large scale to the injuries encountered in modern warfare, worked out the details of the method from hard experience, defined its scope and limitations, and brought about a revolutionary improvement in the treatment of war wounds first in Spain, later in France, and then in this country, often in the face of indifference and sometimes active opposition. Mr. Watson-Jones may not call this a development, in which case the word as he uses it has lost its usual meaning. At any rate, those who have had the privilege of seeing Trueta at work are convinced that he has carried the method far beyond the place claimed for it by its originator, and made a most valuable contribution to the surgery of war.—I am, etc.,

G. R. GIRDLESTONE.
H. J. SEDDON.

Wingfield-Morris Orthopaedic Hospital,
Oxford, Nov. 11.

Alien Doctors in Great Britain

SIR,—With great respect I think your correspondent (November 2, p. 613) must have been misinformed as to the working of the Ministry of Health Order concerning alien doctors and hospitals. At any rate his friends can take heart of grace from the fact that an important post on the staff of the York County Hospital is held by an alien of like race to themselves who has not been naturalized. It would be a remarkable thing if contact with members of His Majesty's Forces could be avoided here. Here is indeed a shining example of the heights to which British altruism can rise, and reflection upon it ought to mitigate in some measure the "disappointment and bitterness" referred to in Mr. Payne's letter.—I am, etc.,

Harrogate, Nov. 4. JAMES FISON.

*** The Minister of Health has now withdrawn some of the limitations placed on the employment in hospitals of refugees of German, Austrian, and Italian nationality. The circular issued to hospital authorities describing the areas in which they may be employed and the conditions of that employment was summarized in the *Journal* of November 9 (p. 653). —ED., *B.M.J.*

Canadian Hospitality for British Doctors' Children

SIR,—We, as two members of the B.M.A. who on the invitation of friends with relations in Canada sent out small sons to that country early in July, should appreciate the opportunity to express through you our deep appreciation of the kindness of the Canadian Medical Association, which on their arrival made arrangements for their reception, and of the Canadian Government, which has made itself responsible for their welfare while in Canada. Our sons soon after they arrived were transferred to the home of a leading Toronto doctor, where they have received every possible care and kindness, and they are very happy. After a holiday on the Canadian Lakes they were sent to an excellent school. Education in Canada, which is maintained by the Government, is good, and practically free. We had hoped to be able to contribute to their upkeep while in Canada through the Government Evacuation Scheme, whereby British parents could pay according to their means, but learned to our disappointment that this could not be allowed. It has, however, made no difference to the attitude of the children's hosts, who continue to display a generosity almost unbelievable to anyone who does not know Canadian people.

Our purpose in writing this letter is, first, to express our gratitude to the Canadian doctors and their Government; secondly, because, although it has been published, the opportunity afforded by the Canadian Medical Association seems little known to British doctors, and it has occurred to us that there may be medical parents in this country whose circumstances are more difficult than our own and who would be glad to avail themselves of the offer of their Canadian colleagues. We are assured in correspondence that many Canadian doctors would be glad to receive the children of British doctors into their homes.—We are, etc.,

H. B. PADWICK.
Bedford, Nov. 3. G. A. METCALFE.

H. Nomededeu (*Thèse de Paris*, 1940, No. 262), who records three illustrative cases, one of which is original, in patients aged from 9 to 46, draws attention to the occurrence of acute non-suppurative thyroiditis of rheumatic origin. The diagnosis may be difficult, for, though the condition is usually accompanied by the signs of acute articular rheumatism, primary or isolated forms may occur in which the rheumatic aetiology is difficult to determine. This form of thyroiditis occurs in repeated attacks with severe general upset, especially fever. Disturbance of the thyroid function does not take place and suppuration never ensues. The immediate prognosis is good. It is only after repeated attacks that sequels may develop such as sclerodermia or Graves's disease. The treatment is that of acute rheumatism, especially administration of sodium salicylate.

Obituary

JAMES ADAM, M.A., M.D.

We announce with regret the sudden death on October 26 of Dr. James Adam, who had been in practice in Hamilton for nearly fifty years. He died while playing his customary Saturday afternoon game on his home golf course.

Dr. Adam, who was 78 years of age, was born in Stirling, into a family connected with Stirling for many generations, and was educated at the High School there. After graduating in arts he studied medicine at Glasgow University, qualifying M.B., C.M. in 1887 and taking his M.D. with commendation in 1900. In 1894 he was admitted to the Fellowship of the Royal Faculty of Physicians and Surgeons. After holding house appointments in the Western Infirmary with Sir Hector Cameron and Dr. Gavin P. Tennant he began in general practice in Hamilton, but large though his practice was it provided insufficient scope for his tireless energy, and he specialized in diseases of the ear, nose, and throat. He joined the staff of the ear, nose, and throat department of the Royal Infirmary in 1906, and in 1919 became its chief, but he held the senior appointment for only three years, under the age limit. On leaving the Royal Infirmary he was appointed surgeon in diseases of the ear, nose, and throat to the Glasgow Corporation hospitals, an appointment which he held until a few years ago, when, disdaining retirement, he became surgeon in charge of an asthma clinic in Stobhill Hospital. He was also surgeon in his special branch to the Lanarkshire County Council hospitals.

Dr. Adam made notable contributions to the literature of his subject, including "Pathology and Treatment of Atrophic Rhinitis" in the *Glasgow Medical Journal* (1909); "Turbinal and Sinus Function" in the *Journal of Laryngology*, 1911, and in the same journal in 1925–6 "Sinusitis the Cause of Bronchiectasis." He was one of the earliest to demonstrate bronchiectatic cavities by means of *x* rays after injection of lipiodol, and he was known at home and abroad as an authority on asthma. His observations on the blood picture in asthma were made among the miners of Lanarkshire, and his monograph *Asthma and its Radical Treatment*, the second edition of which appeared in 1926, and his most recent book, *Asthma and the General Practitioner*, published in 1939, were the fruit of that work. Like the late Sir James Mackenzie, "his research laboratory was in the homes of his patients; like a good naturalist and a good human being, he followed his advantage and made good use of it." His greatest interests outside medicine lay in music and in sport; he was a regular attender at orchestral concerts, and an occasional composer of music for lyrics. He had been a member of the B.M.A. since 1888.

W. G. SPENCER, M.S., F.R.C.S.

Dr. C. O. HAWTHORNE writes: The B.M.A. owes a tribute of gratitude to the late Walter G. Spencer for his experienced guidance and help in the organization in its present form of the Association's library and reading-room. When the Association moved from the Strand to its new home in Tavistock Square he largely organized and directed the necessary plans for the new arrangements. At first it was not possible to adopt these in full, but after a time their value was recognized, and the present housing of the library and reading-room owes much to Spencer's foresight and determination. The value of his work in this direction is well deserving of a sincere word of gratitude and recognition.

It is with regret that we record the death of Dr. F. J. DEANE, one of the medical inspectors in the Ministry of Home Affairs in the Government of Northern Ireland. Dr. Deane qualified at Edinburgh University in 1919 and occupied resident posts in the Royal Infirmary, Edinburgh, and the Northampton General Hospital before being appointed as assistant medical officer to the Down County Mental Hospital, Downpatrick. In 1928 he obtained the D.P.M., and some years afterwards became a medical inspector in the Ministry of Home Affairs. In this position his talents were well applied, and he seemed destined to proceed far in the administrative work for which he seemed to be so obviously adapted. He was popular and well liked by all those with whom he came in contact, and combined with his official duties a happy manner which seemed to soften any criticisms which his reports necessitated. With his colleagues in the Ministry as with his brethren in the profession he was very much esteemed, and that he did not survive an acute surgical emergency was a tragedy in one who had contended with ill-health for many years. He married Mabel, the daughter of Dr. J. Hamilton Stewart of Belfast.

The following well-known foreign medical men have died: Prof. WLADIMIR KÖPPEN of Graz, the Nestor of international meteorologists and climatologists, aged 94; Prof. MAX BIELCHOWSKY, formerly a member of the Kaiser Wilhelm Institute for cerebral research and author of important works on the normal and pathological histology of the nervous system, in London, aged 71.

Universities and Colleges

UNIVERSITY OF LONDON

Sir Girling Ball has been elected Dean of the Faculty of Medicine for the period 1940–2.

UNIVERSITY OF MANCHESTER

John Crighton Bramwell, M.D., F.R.C.P., has been appointed Professor of Systematic Medicine, and Thomas Herbert Oliver, M.D., F.R.C.P., Professor of Clinical Medicine.

UNIVERSITY OF SHEFFIELD

Prof. H. N. Green and Prof. E. J. Wayne have been appointed representatives of the University on the committee of management of the Sheffield Hospitals Council.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Arnott Demonstrations

Dr. A. J. E. Cave will give three demonstrations of anatomical specimens in the College Museum at the Royal Society of Medicine (1, Wimpole Street, W.) on Monday, Wednesday, and Friday, November 18, 20, and 22, at 2.30 p.m. each day. The demonstrations are open to advanced students and medical practitioners.

Lectures

The Bradshaw Lecture on "Pride and Prejudice in the Treatment of Cancer" will be delivered by Sir Alfred Webb-Johnson at the Royal Society of Medicine (1, Wimpole Street, W.) on Wednesday, November 27, at 2.30 p.m.

Mr. T. P. McMurray will deliver the Robert Jones Memorial Lecture on "The Semilunar Cartilages" at the Royal Society of Medicine (1, Wimpole Street, W.) on Thursday, December 5, at 2.30 p.m.

Fellows and Members of the College are invited to attend, and students and others who are not Fellows or Members of the College will be admitted to both these lectures on presentation of their private visiting cards.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At the annual meeting of the Royal Faculty of Physicians and Surgeons of Glasgow the following officers were elected for the ensuing year: *President*, Mr. Roy F. Young; *Visitor*, Mr. James H. MacDonald; *Honorary Treasurer*, Mr. William J. Richard; *Honorary Librarian*, Dr. W. R. Snodgrass; *Representative on General Medical Council*, Mr. J. Douglas Brownlie.

The Services

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Temporary Surgeon Lieut. SAMUEL PAUL HERBERT FERGUS, R.N.V.R., is posted as "Missing, Presumed Killed" in an Admiralty casualty list published on November 11. Dr. Fergus was educated at the University of Leeds and graduated M.B., Ch.B. in 1937, and had held the posts of house-surgeon at the General Infirmary at Leeds and resident medical officer at Leeds Public Dispensary and Hospital. He joined the British Medical Association in June, 1939.

ARMY MEDICAL SERVICES

Prisoner of War

Colonel George Alfred Duncan Harvey, C.B., C.M.G., A.M.S.
Acting Colonel David Proudfoot Levack, A.M.S.

ROYAL ARMY MEDICAL CORPS

Prisoners of War

Lieut.-Colonel Tristram Albert Seton Samuel, M.C., R.A.M.C.
Major William Robert Henderson, R.A.M.C.
Acting Major John Anderson Chapel, R.A.M.C.
Acting Major George Macnaughton Rae Duffus, R.A.M.C.
Captain William Mackay Davidson, R.A.M.C.
Lieut. George Ian Davidson, R.A.M.C.
Lieut. William Walter Deane, R.A.M.C.
Lieut. Gordon Sheridan Alfred Knowles, R.A.M.C.
Lieut. Duncan James Macrae, R.A.M.C.
Lieut. Birendra Nath Mazumdar, R.A.M.C.
Lieut. Niall Eugene O'Neill, R.A.M.C.
Lieut. Robert Pollock, R.A.M.C.
Lieut. Ian Falconer Rose, R.A.M.C.
Lieut. John Edward Wooding, R.A.M.C.

DEATHS IN THE SERVICES

Surgeon Rear-Admiral DAVID WALKER HEWITT, C.B., C.M.G., R.N. (ret.), died on October 25, aged 70. He was born in 1870, the son of the late Mr. John Hewitt, and was educated at the Royal School, Dungannon, University College, Galway, the University of Edinburgh, and St. Bartholomew's Hospital. He graduated M.B., B.Ch., and B.A.O. of the Royal University of Ireland in 1895, and took the F.R.C.S. in 1912. Entering the Royal Navy as surgeon in 1897, he was promoted to fleet surgeon in 1913 for conspicuous professional merit, became surgeon captain during the war of 1914–18, and surgeon rear-admiral in 1924. He was in charge of the Royal Naval Hospital, Haslar, from 1920 until his retirement in 1929. He received the C.B. in 1916 and the C.M.G. in 1918. In 1908 he married Nora Gertrude Pinkey, who survives him, and had one son and two daughters.

Medical Notes in Parliament

The Workmen's Compensation and Benefit (Byssinosis) Bill was read a first time in the House of Lords on November 5.

The House of Commons in committee on November 7 approved a Supplementary Estimate for £86,000 for the Ministry of Health, including a grant-in-aid to the National Radium Trust. It agreed to postpone discussion till a later stage.

Welfare Work in Factories

Sir Francis Fremantle presided at a meeting of members on November 5, at which Mr. Ernest Bevin spoke on industrial fatigue and welfare work in factories. Mr. BEVIN said it had been necessary to issue a Welfare Order applying to works or groups of works employing upwards of 250 persons. An adequate supply of trained welfare officers had been assured by payment of fees for the attendance of selected candidates at courses arranged by the universities. The appointment of doctors experienced in problems of fatigue and psychology was another feature of the scheme, and a special course of instruction in industrial hygiene would be provided at the London School of Hygiene. The factory doctor was now recognized as essential in works management to supervise the health of the workers, to ensure prompt treatment of injuries, and to co-operate with the general practitioner and the hospital in securing early restoration of the patient to industrial efficiency. Other welfare officers would encourage local organizations in the provision of recreation, relaxation, and amusement outside the factories. They would also assist in arranging for the suitable billeting of imported workers and for transport facilities to reduce fatigue and discomfort.

Evacuation of Aged and Infirm

Answering questions on November 5 about the evacuation of the elderly and infirm, Miss HORSBRUGH said arrangements were already made for the transfer of those in need of medical and nursing care who habitually made use of air-raid shelters in the metropolitan boroughs and in East Ham and West Ham. Evacuation of all elderly people would not be practicable. Many chronic cases had already been taken to large houses on the outskirts of London. It was not easy to get this accommodation. Sir FRANCIS FREMANTLE asked whether empty Emergency Medical Service hospitals could be temporarily used for the aged and infirm. Miss HORSBRUGH said such empty hospitals, which were not many, were already used for these purposes. Mr. MESSER remarked that the Duke of Bedford's hospital, prepared for patients, was being used by the Foreign Office. Miss HORSBRUGH replied that hospital accommodation throughout the country was at present more than sufficient, and certain hospitals were being used for other purposes. As regards evacuation, facilities for the evacuation of mothers with children were at present confined to the administrative county of London together with East and West Ham.

Medical Care of Home Guard

On November 5 Sir EDWARD GRIGG told Mr. Groves that a letter was received from the Central Medical War Committee last July offering the services of the medical profession throughout the country, free of charge, for attendance on members of the Home Guard who sustained casualties while on duty, the arrangements being made through the Central Committee and its local committees. This offer was gratefully accepted by the War Office, and the Central Committee was invited to place its local organizations in touch with each of the Territorial Army County Associations. The offer was understood to include the free supply of such drugs and dressings as the doctor might have available for the first-aid treatment of the patient, and the circumstances in which the doctor would be called upon to render assistance would be similar to those in which emergency medical treatment was obtained from a doctor in the case of ordinary accidents.

Army Inoculation against Tetanus and Typhoid

Mr. LAW, replying to a question on November 5, stated that in no case had tetanus been reported in wounded soldiers who had received protective inoculation. All the cases reported had occurred in non-immunized men. With regard to the T.A.B. inoculation, the reported incidence of proved infections of typhoid and paratyphoid fevers in the whole of the B.E.F. and the Home Forces, from the outbreak of war to the present time, had been thirty-two cases, twenty-six of which had never received T.A.B. vaccine. About 80% of the Army accepted inoculation. In no other army was typhoid immunization not universal. On the basis of the figures he had given, the chance of contracting typhoid or paratyphoid fever was increased roughly seventeen times by refusing inoculation.

Lord Horder's Committee: Further Report

Miss WILKINSON on November 5 told Mr. Daggar that Lord Horder's Committee was appointed by the then Minister of Home Security and the Minister of Health on September 14, 1940, and presented an interim report within a few days. Since then the committee had continued to sit, and the Ministers had now received a further report bringing the account of their investigations and findings up to date. The recommendations of their interim report were accepted, and action was being taken on them. This also applied to some of the recommendations in the further report; the others were now under consideration. It was proposed to publish the recommendations of the committee.

Price of Milk

Lord ADDISON opened a debate in the House of Lords on November 6 on the price of milk. Lord MOYNE, replying for the Ministry of Agriculture, said the scheme launched on July 21 for the supply of milk free or at half-price to mothers, to children under 5, and to expectant mothers had been a success. Out of a possible 3,900,000 persons, 3,000,000 were recipients of this benefit, and 30% of the recipients were getting milk for nothing. It was still necessary that wider measures should be taken. For these the committee under Lord Perry had made far-reaching and drastic proposals, on which Lord Woolton hoped to reach a decision at an early date.

Public Inoculation against Tetanus and Typhoid

Dr. HILL asked on November 7 whether, in view of the successful results of the new inoculation of the Army against tetanus, the same protection could be offered to the police, the fire services, and air-raid precautions services in general. Mr. HERBERT MORRISON said that his Department and the Ministry of Health had concluded that special measures of advance immunization against tetanus should not be extended to the services mentioned. An adequate safeguard against risk of tetanus was afforded by the normal method of inoculation after a person became a casualty.

Dr. HILL also asked Mr. MacDonald on November 7 whether, in view of possible epidemics of typhoid and paratyphoid, means and material were available for widespread inoculation in regions likely to be affected. He inquired, in view of the fact that the commonest source of such infection was from workers employed in connexion with food and water supplies, whether the Minister would provide for all such workers to be protected without delay. Mr. MACDONALD, in reply, said means and material were available for extensive inoculation of the population of particular localities if they should be placed at special risk. The action suggested by Dr. Hill would not have the effect of protecting the consumer against infection. He had sent a circular to local authorities drawing their attention to other measures which would reduce risks of infection. There would be no compulsory inoculation. Workers in wells were covered by this answer.

Public Assistance Institutions' Dieting.—Replying to Sir Percy Hurd, who alleged that some public assistance committees, under the guidance of their medical officers, were still ordering potatoes to be machine-pared, Miss HORSBRUGH said that the dietary of a public assistance institution was a matter for the decision of the authority after they had obtained the advice of the medical officer. The Minister was aware of the advantages of the method of cooking potatoes in their skins, and was instructing his inspectors to give suitable advice on this matter to public assistance authorities as occasion arose in conjunction with certain other advice as to the best use of food in wartime.

Compensation for Byssinosis.—In the House of Lords on November 5 the DUKE OF DEVONSHIRE presented a Bill for the payment of compensation or disablement benefit in the cases of male workers who died or became disabled or permanently incapacitated as a result of byssinosis.

Care of Expectant Mothers in Danger Areas.—Miss HORSBRUGH on November 5 informed Mr. Sorensen that arrangements had been made under the Government evacuation scheme for all expectant mothers in evacuation areas who wished to be evacuated for their confinement to be provided for in reception areas. Mr. Sorensen was under a misapprehension in suggesting that special shelters were provided for the reception of expectant mothers. Those in charge of shelters had, however, clear instructions as to the steps to be taken in the event of premature births occurring.

Antiseptic Pastilles for Shelterers.—On November 7 Mr. SORENSEN asked Mr. MacDonald to recommend or instruct local authorities in control of public shelters used for sleep at night to make available in all such shelters supplies of antiseptic and medicinal tablets or pastilles for free distribution with a view to minimizing ailments and infection. Mr. MACDONALD replied that medical aid posts in the larger shelters would be equipped with appliances and drugs on a schedule recommended by the committee over which Lord Horder presided. This schedule included some medicinal tablets. Mr. SORENSEN contended that as the Government distributed plugs for the ears freely it could equally well distribute free pastilles for the throat. Mr. MACDONALD said whatever he was advised to be necessary would be available for free distribution. In some shelters these pastilles were being distributed now. The distribution would apply to shelters throughout the country.

Notes in Brief

Mr. Bevin states that special inquiries have been instituted to find whether the more extensive night employment of youths between 16 and 18 is producing ill-health or undue fatigue. If ill effects are found, appropriate action will be taken.

Mr. Malcolm MacDonald told Mr. Rhys Davies on November 7 that he did not know psychiatrists employed as civilians in mental hospitals were not allowed to treat patients in the same hospitals who were members of the Forces. He promised to go further into the matter.

On November 7 Sir Ernest Graham-Little asked the Home Secretary to consider the release from detention in Brixton Prison of a surgeon on whose behalf representations, from intimate knowledge, had been made by members of the medical profession. Sir Ernest referred to inconvenience suffered by three London voluntary hospitals of whose honorary staffs this surgeon was an active member. Mr. Herbert Morrison said this case was to be reviewed by the Advisory Committee, which would take account of representations on behalf of the appellant.

Medical News

The Royal Society of Medicine announces that a report, with illustrations, of the discussion on the treatment of burns in the Sections of Surgery and of Therapeutics on November 6 (summarized in the *Journal* this week at page 679) will shortly be published, and copies will be obtainable from the Society's Editorial Office, 1, Wimpole Street, London, W.1, price 1s., post free.

It is announced that the following medicaments will not be subject to the purchase tax: Disinfectants which are not prepared solely or mainly for human use internally or externally, cod-liver oil, cod-liver oil and malt, simple emulsions of cod-liver oil, halibut-liver oil, halibut-liver oil and malt, vitaminized oil *B.P.* (Second Addendum), extract of malt with vitaminized oil *B.P.* (Second Addendum), and emulsion of vitaminized oil *B.P.* (Second Addendum). The purchase tax is chargeable, however, at the reduced rates, under Class 19, on pastilles, lozenges, gums, tablets, etc., containing the following medicaments or medicinal flavourings: Bismuth, cherry bark, chlorodyne, chloroform, cinnamon, eucalyptus, glycerin and blackcurrant, honey, glycerin, and lemon, iodine, menthol, paregoric, thymol, sulphur. These will be taxable whether sold in small containers or in bulk.

The new *x*-ray department of the General Infirmary at Leeds has been completed, and it is hoped soon to open the private patients' wing. This is part of an extension scheme costing a quarter of a million pounds. The private wing has accommodation for ninety patients, and for the time being it is proposed to open only twenty-nine single rooms and seven four-bed wards. The charge for those occupying single rooms will be from 6 to 8 guineas a week and 5 guineas after the first fortnight, and in the four-bed wards the charge will be 5 guineas a week and 4 guineas after the first fortnight. During the war an extra 10% will be added to the above charges, which will entitle patients to accommodation, board, nursing, and surgical dressings. The four-bed wards are reserved for patients whose incomes do not exceed the following: £450 a year for a single patient, £550 a year for a person with one dependant, and £650 a year for a person with more than one dependant. Fees for operation and consultation will be paid to the Infirmary, and for patients in the four-bed wards will in no case exceed 30 guineas.

Sir D'Arcy Power reached his 85th birthday this week, on November 11.

The newly founded Latin-American Society of Plastic Surgery has recently held its first meeting at São Paulo, Brazil.

Dr. Louis Martin, director of the Pasteur Institute of Paris, has succeeded Dr. Sieur as president of the Academy of Medicine.

According to Assistant Surgeon-General R. A. Vonderlehr of the U.S. Public Health Service, 324,000 out of the 20,000,000 men of draft age in the United States are infected with syphilis.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The four common important diseases—diphtheria, scarlet fever, measles, and whooping-cough—have all increased in incidence during the week, as would be expected on the approach of winter; influenza, only notifiable when complicated by pneumonia, shows a similar trend. Notifications of cerebrospinal fever have risen slightly and those for acute poliomyelitis have fallen; there has been a rise in the figures for dysentery and a fall in those for enteric fever, but the changes are only slight.

The reopening of schools and the crowding of people in shelters, the lowering of the resistance of mucous membranes generally associated with humid atmospheric conditions and frequent changes of temperature, all predispose to greater spread of infection at this time of the year. Means of preventing, or at least of restricting, such spread are being widely discussed and put on trial. Three practicable methods are available, but their relative efficacy under field conditions have not yet been adequately assessed. Prophylactic inoculation is undoubtedly the best measure against diseases for which a reliable reagent is available, but against such diseases as influenza either the wearing of masks by personnel suffering from, or exposed even for short periods to, the disease, or the prevention of pollution of rooms by aerosols or ultra-violet radiation is applicable. Apart from the cost, technical difficulties have to be overcome before the value of these methods can be assessed. At best they can only be adjuvants to the established methods of segregation of actual or potential sources of the *materies morbi*, and immunization—where possible—of presumed susceptibles, especially such as are likely to be exposed.

Measles

Measles is giving public health authorities most anxiety at present not only because of its wide prevalence but because of its high infectivity, potential risk to children at a vulnerable stage of their life, and the need for increased hospital accommodation for cases at least during the infectious stage, in order to prevent spread among susceptibles in public shelters, rest centres, and billets. Existing accommodation will probably be severely taxed in districts where some of the available accommodation is allocated for air-raid casualties, and some modification of current arrangements may be found necessary to meet possible contingencies. For selected contacts in whom an attack of measles might be dangerous, measles convalescent serum may be used for prevention with every prospect of success, but this effect only lasts two to three weeks; controlled attenuation of attack is preferable if conditions are suitable, and is readily secured by means of adult serum or placental extract. With the exception of Anglesey every administrative public area is involved in the present measles epidemic, but wide fluctuations in incidence continue, even in large centres of population. Of the large towns Sheffield (621) heads the list, while Liverpool 595, Manchester 457, Northampton 263, and Bolton 207, surpass London (195). On the other hand, Birmingham and Cardiff, with 31 and 4, respectively, have practically escaped the present epidemic so far. The returns reveal that rural and urban districts have suffered as heavily as, possibly more heavily in comparison with population than, the more densely populated areas, but allowance must be made for the effects of evacuation. The counties chiefly affected are: Lancaster 2,255 (Liverpool 595, Manchester 457, Bolton 207, Salford 172, Leigh M.B. 137, and 55 municipal boroughs and urban districts); Yorks, West Riding, 1,799 (Sheffield 621, Rotherham 166, Bradford 132, Leeds 91, York 70, Conisbrough U.D. 105, Morley M.B. 43, Goole R.D. 44, while few urban and rural districts escaped); Derby 675 (Derby 123, Chesterfield M.B. 160, Alfreton U.D. 79, Chesterfield R.D. 94); Northampton 448 (Northampton 263, and in all the urban and rural districts with 3 exceptions); Middlesex 415 (Harrow U.D. 105, Twickenham M.B. 133); Chester 570 (Stockport 101, Birkenhead 65, Macclesfield M.B. 148, and in 20 out of 22 urban districts and 6 out of 8 rural districts). The disease has slightly receded in Scotland, especially in Glasgow 77, but remains prevalent in Aberdeen 109, Greenock 52, Port Glasgow 48, Dundee 30. The recorded deaths in the great towns indicate that the disease is generally of a mild character.

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INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended October 12, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1940					1939 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	116	9	35	1	5	23	—	5	2	—
Deaths		1	3				—	1		
Diphtheria	1,336	37	429	31	19	941	33	204	45	37
Deaths	34	—	12	2	1	20	—	5	1	1
Dysentery	69	3	71	—	—	33	4	89	1	—
Deaths			2	—	—			4	—	—
Encephalitis lethargica, acute	3	—	—		—	7	—	—		—
Deaths		—	—				—	—		
Enteric (typhoid and paratyphoid) fever	57	—	14	5	2	42	2	1	7	4
Deaths	1	—	—	—		3	—	—	—	—
Erysipelas		17	61	4	5			54	15	6
Deaths		—	1				—	—		
Infective enteritis or diarrhoea under 2 years										
Deaths	49	5	12	8	4	29	6	22	4	4
Measles*	9,905	195	381		6			6		15
Deaths	13	2	2	—	—	2	—	—	—	—
Ophthalmia neonatorum	77	1	19	2	—	88	10	16	—	1
Deaths										
Pneumonia, influenzal†	660	49	5	—	—	519	46	10	2	2
Deaths (from influenza)	15	1	—	—	1	20	2	3	1	1
Pneumonia, primary			166	9				133	12	
Deaths‡		81		8	6		7		7	6
Polio-encephalitis, acute	1	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	30	—	1	1	—	31	1	—	1	1
Deaths		—	—				—	—		
Puerperal fever	—	1	8	1	—	3	3	6	—	1
Deaths		—					1§			
Puerperal pyrexia	145	8	16		2	176	14	27		1
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	2,019	79	251	56	54	1,448	54	230	66	112
Deaths	2	—	—	1	—	—	—	—	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths		—	—	—	—		—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths		—	—	—	—		—	—	—	—
Whooping-cough*	1,373	11	131		12			12		1
Deaths	11	1	—	1	2	2	—	1	—	—
Deaths (0-1 year)	315	47	56	24	15	258	27	65	19	17
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	5,522	1,453	553	146	127	4,439	691	644	157	141
Annual death rate (per 1,000 persons living)			11.2	9.7	11.1			13.0	10.6	12.4
Live births	6,033	763	872	307	202	5,311	666	862	356	217
Annual rate per 1,000 persons living			17.6	20.5	17.7			17.4	23.9	19.1
Stillbirths	221	23	31			244	18	25		
Rate per 1,000 total births (including stillborn)								28		

* Made notifiable generally on November 1, 1939.

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

‡ Since January 1, 1940, figures for London (b) have been for deaths from all forms of pneumonia; the corresponding figures for 1939 relate to deaths from lobar pneumonia only.

§ Death from puerperal sepsis.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Income Tax

Board and Lodging of Assistant

"C. A. S." inquires what is the generally accepted weekly amount that may be claimed by the practitioner providing the board, etc.

*** The amount to be claimed should be a proportion of the total household expenses, bearing in mind any differences between domestic staff and others, and no standard rate can be put forward with confidence where circumstances vary so much. Perhaps £2 a week would usually be a reasonable amount to claim.

LETTERS, NOTES, ETC.

A "Double Duty" Fire

At the Building Centre in Bond Street last week Mr. George Hicks, M.P., opened a small exhibition of methods of economizing coal and improving ventilation in dwelling houses. The central feature of the exhibition is the Hales convector fire, developed by the Coal Utilization Research Association on behalf of the British coal industry. The convector is a "double duty" fire, combining the advantages of the open fire and the central heating system. It is a complete iron grate with its own stool bottom and fret, designed to fit inside the existing grates of at least 60% of the fireplaces in use to-day, and sealed off at the bottom and top. A hollow space is left between the cast-iron back and sides of the convector and the existing firebrick. When the fire is lighted and the iron becomes hot it warms the air in this space, and the air then goes into the room through louvres at the top of the convector frame, while at the same time fresh cool air is drawn in through slots at the bottom. In this way a constant supply of warm air is circulated through the room, supplementing the radiated heat from the burning coal and adding to the efficiency of the ventilation. It was mentioned that tests with the convector have shown a saving of 40% of coal for the equivalent heat output. In a room fitted with a good modern grate burning 2.65 lb. of coal per hour on an average winter day the consumption would be reduced to 1.6 lb. if the Hales convector were fitted. The most expensive model, in vitreous enamel, costs only 46s. 9d., so that the appliance should soon pay for itself in what it saves in coal. The Ministry of Supply has given a special allocation of cast iron to enable 10,000 convectors to be manufactured. The open coal fire has been described by one medical authority as the healthiest form of heating, but it is certainly one of the least economical. The convector reduces the waste and at the same time adds to the health-giving properties by circulating the warm air, as the ordinary coal fire does not, into the farthest corners of the room.

Dosage in Prophylactic Inoculation

DR. MICHAEL R. BRADY (London, W.1) writes: In view of the widespread interest in prophylactic inoculation I should like to make a few suggestions which may be very helpful. In my experience of the last ten years of prophylactic inoculation I have found that the ordinary orthodox dose is much too high for colds, typhoid, and influenza. The same results can be obtained by smaller doses, and thus eliminate one of the greatest setbacks to the advance of prophylactic immunization—that is, severe reactions. The result of my experience in inoculating large numbers, which means routine work every winter, is that I have evolved a series of doses which I find are very efficient from a prophylactic point of view, and produce the minimum amount of reaction. In the case of the common cold the vaccine is made from the organisms isolated from cases suffering from the prevailing epidemic. The dosage is as follows: First dose, 5 million of each micro-organism isolated; second dose, 10 million; third, 25 million; fourth, 100 million; fifth, 200 million. If there is a reaction after the first dose I put that patient into what I call the sensitive class, and the series of doses which he gets is 2½, 5, 7½, 10, and 25 million. As a matter of experience the cases which go into the sensitive class are those who are perpetually subject to colds.

Disfigurement of Nails

"B." writes in reply to "Digit" (November 2, p. 618): A lady over 80 years of age had this condition. I advised rubbing in olive oil (once suggested for nail-biting in children in the *Journal*) to soften the nails and reduce sensation in them. She has also had twice weekly, for other reasons, injections of 1 c.cm. vitamin B_1. Onychia occurs in pellagra and perhaps also in beriberi, as stated in the annotation on vitamin B_1 in Chinese nutrition (September 28, p. 424). The zinc content of the nails is reduced in beriberi to half its normal value. My patient's nails showed improvement after four months, and now, after two years, are in good condition. She also took bemax. "Digit" may get some help from pondering over this unexpected result.

A.R.P. for Cars

MR. W. H. OGILVIE (London, W.1) writes: Most of us must travel on our lawful occasions during air raids, and in so doing are exposed to the remote chance of personal involvement. A direct hit from a heavy bomb would be just too bad, but injury by falling splinters, most of which will easily penetrate the pressed steel of a car body, is more likely and more easily guarded against. Of the safeguards usually seen, a steel sheet is hard to obtain and difficult to fix, and a double-bed mattress strapped to the roof is slightly ridiculous. A simple and very cheap protection can be arranged inside the roof by cutting a sandwich of five layers of "chicken wire" with four of army blanket between them to shape, and retaining it with a sheet of beaver board sprung into place. If need be the board can be coloured to suit the decoration of the car.

First Aid

DR. M. A. GOODWIN writes: May I draw your attention to a state of affairs which I believe has become more prevalent since the onset of hostilities and the subsequent teaching of first aid to many voluntary workers. It is a case in which a little learning is truly a dangerous thing, for whilst recognizing that these people are doing their duty with the best of intentions, yet I am seeing more and more cases, particularly of septic hands, which have been "treated" by first-aid workers when they should have been sent to hospital much sooner. The patient finally arrives with a condition of the hand which inevitably spells some loss of function, which would have been avoided had earlier treatment been instituted. I would stress the importance when instructing these people that their duty is not to treat but to render first aid and send the patient to hospital at the most opportune moment.

Large-scale X-ray Examinations

DR. E. WEATHERHEAD (Southborough, Tunbridge Wells) writes: In my letter under this heading (November 2, p. 607) there occurs the sentence: "I have been . . . struck by the number of cases in which the diagnosis rested only on *x*-ray reports, and in which, after perhaps some years, clinical evidence was still lacking and a further *x*-ray examination showed no evidence of *tubercles*." The use of the word "tubercles" here may give rise to a false impression. What I actually wrote, or thought I had written, was "tubercle," as merely short for "tuberculosis" or "tuberculous disease," one or other of which terms would have been better. "Tubercles," in the plural, certainly gives a wrong impression, never intended by me, as regards *x*-ray evidence.

The Liver in Diabetes Mellitus: A Correction

DR. GEORGE GRAHAM (London, W.1) writes: My attention has been drawn to a mistake which I made in the second Croonian Lecture published in the *Journal* of October 19 (p. 513). The figures for the carbohydrate:fat ratio are given incorrectly on p. 515, and should be 0.69:1; 0.84:1; 0.8:1; 1.78:1; 0.61:1; 1.65:1. Fortunately the mistake does not affect the argument in the text.

A Corrected Reference

DR. R. L. WYNNE informs us that the reference at the end of the second paragraph of his letter which appeared in the *Journal* of November 2 (p. 611) should have been as follows: (Dallemagne, M., *J. Chir.*, Brux., 1935, **34–32**, 298).